Vol. 985 Number 1

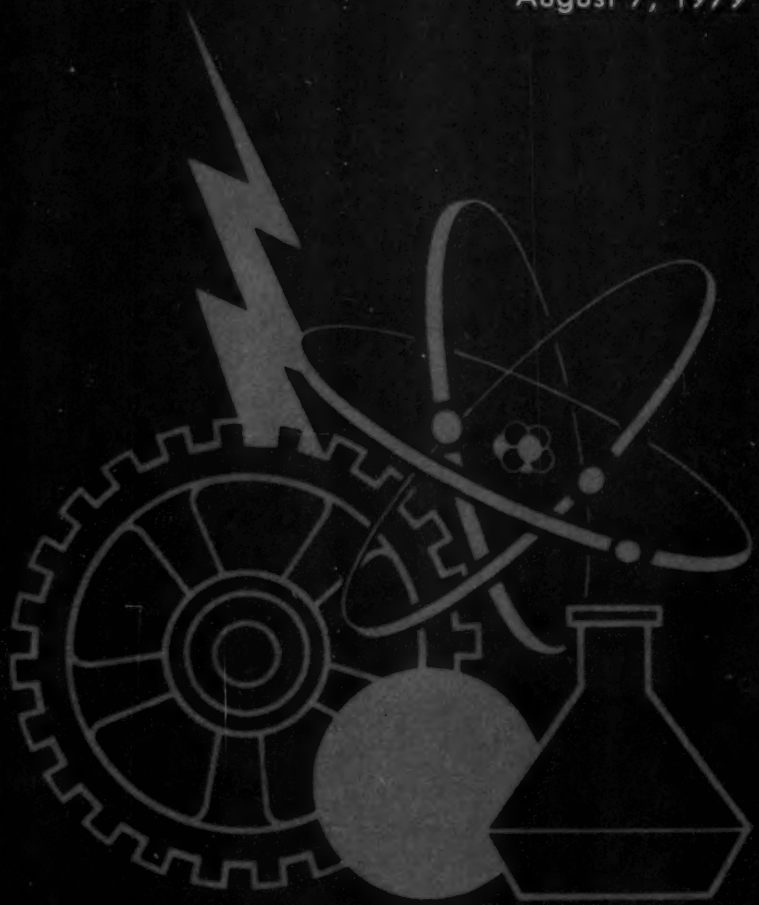
OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

August 7, 1979



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OFFICIAL GAZETTE of the
UNITED STATES PATENT and TRADEMARK OFFICE

August 7, 1979 Volume 985 Number 1

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT, including the amounts of the fees thereunder and the States that may be designated in international applications, consult the notice entitled "Update of information concerning the Patent Cooperation Treaty" appearing in the OFFICIAL GAZETTE of July 3, 1979.

Effective August 1, 1979 the international fees are increased to the following amounts:

Basic fee under PCT Rule 15.1(i) for an international application containing 30 sheets or less	$190.00
Supplemental fee to the Basic fee for each page of an international application in excess of 30 sheets	3.50
Designation fee under PCT Rule 15.1(ii)	45.00

July 3, 1979.

LUTRELLE F. PARKER,
Acting Commissioner of Patents and Trademarks.

Board of Appeals Decisions Rendered in the Month of June 1979

Affirmed	227
Affirmed in Part	35
Reversed	79
Total	341

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

4,029,176, Re. S.N. 930,656, Filed Aug. 2, 1978, Cl. 187/52 R, DOORWAY SAFETY DEVICE, Gerald W. Mills, Owner of Record: *Inventor*, Attorney or Agent: Roberts B. Larson, et al., Ex. Gp.: 313

PATENT NOTICES

Certificates of Correction for the Week of Aug. 7, 1979

P.P. 4,136	4,121,836	4,140,780	4,149,599
Re. 29,913	4,124,291	4,140,863	4,149,778
Re. 29,994	4,125,405	4,141,899	4,149,782
3,950,873	4,125,520	4,141,915	4,149,878
4,068,292	4,125,731	4,142,227	4,149,953
4,071,565	4,127,013	4,142,662	4,149,975
4,076,709	4,129,189	4,142,667	4,150,037
4,076,802	4,130,658	4,142,850	4,150,929
4,080,251	4,133,635	4,143,432	4,150,954
4,087,795	4,134,114	4,144,015	4,151,486
4,090,855	4,134,250	4,144,273	4,152,165
4,097,805	4,134,783	4,146,331	4,152,342
4,101,488	4,134,823	4,146,627	4,152,535
4,105,691	4,137,059	4,146,658	4,152,576
4,107,650	4,137,551	4,146,855	4,152,782
4,109,487	4,138,151	4,146,996	4,154,013
4,117,090	4,138,186	4,147,028	4,154,723
4,117,101	4,138,540	4,147,619	4,155,153
4,117,807	4,138,562	4,147,794	4,155,263
4,119,179	4,138,578	4,148,764	4,155,762
4,119,600	4,139,997	4,148,920	
4,120,306	4,140,444	4,149,367	
4,121,762	4,140,767	4,149,421	

Disclaimers

Design No. 246,046.—*Allen Dana Hawthorne,* New Canaan, Conn. ELECTROPHOTOGRAPHIC APPARATUS OR SIMILAR ARTICAL. Patent dated Oct. 11, 1977. Disclaimer filed May 21, 1979, by the assignee, *International Business Machines Corporation.*

Hereby enters this disclaimer to the sole claim of said patent.

3,478,397.—*Florentin J. Pearne,* Alhambra, *Frank S. Pearne,* San Gabriel, and *Frederick G. Robson,* Long Beach, Calif. BRICK CUTTER AND HACKER. Patent dated Nov. 18, 1969. Disclaimer filed Aug. 24, 1978, by the assignee, *AMI Industries, Inc.*

Hereby enters this disclaimer to claim 6 of said patent.

3,958,905.—*Homer J. Wood,* Sherman Oaks, Calif. CENTRIFUGAL COMPRESSOR WITH INDEXED INDUCER SECTION AND PADS FOR DAMPING VIBRATIONS THEREIN. Patent dated May 25, 1976. Disclaimer filed Apr. 18, 1979, by the assignee, *Deere & Company.*

Hereby enters this disclaimer to claims 10 and 11 of said patent.

4,089,178.—*Ryuso Mikami,* Ichihara, and *Tsuneo Hanada,* Chiba, Japan. PROCESS FOR PREPARATION OF WATER-SOLUBLE, SILICONE MODIFIED ALKYD RESINS. Patent dated Jan. 17, 1978. Disclaimer filed June 7, 1979, by the assignee, *Toray Silicones Company, Ltd.*

Hereby enters this disclaimer to claims 1–5 of said patent.

4,075,418.—*Mitsuo Nemoto,* Machida, and *Kimiyasu Honma,* Kokubunji, Japan. STEREOPHONIC PICKUP CARTRIDGE. Patent dated Feb. 21, 1978. Disclaimer filed Oct. 16, 1978, by the assignee, *Kabushiki Kaisha Audio-Technica.*

The term of this patent subsequent to Sept. 25, 1990, has been disclaimed.

Dedications

3,604,996.—*Fritz Norman Lutz,* Northfield, Ohio. CONTROLLED POWER SUPPLY SYSTEM. Patent dated Sept. 14, 1971. Dedication filed May 29, 1979, by the assignee, *The Warner & Swasey Company.*

Hereby dedicates the remainder of the term of this patent to the Public.

4,063,835.—*Wallace T. Husband,* West Vancouver, British Columbia and *Howard A. Larlee,* Surrey, British Columbia, Canada. FRAME CONSTRUCTION. Patent dated Dec. 20, 1977. Dedication filed May 18, 1979, by the assignee, *E-Z-Rect Metal Products, Ltd.*

Hereby dedicates to the Public the entire term of said patent.

National Technical Information Service

GOVERNMENT-OWNED INVENTIONS

Notice of Availability for Licensing

The inventions listed below are owned by the U.S. Government and are available for domestic and possibly foreign licensing in accordance with the licensing policies of the agency-sponsors.

Copies of the patents cited are available from the Commissioner of Patents and Trademarks, Washington, D.C. 20231, for $.50 each. Requests for copies of patents must include the patent number.

Copies of the patent applications can be purchased from the National Technical Information Service (NTIS), Springfield, Va. 22161 for $4.00 ($8.00 outside North American Continent). Requests for copies of patent applications must include the patent application number. Claims are deleted from patent application copies sold to the public to avoid premature disclosure in the event of an interference before the Patent and Trademark Office. Claims and other technical data will usually be made available to serious prospective licensees by the agency which filed the case.

Requests for licensing information on a particular invention should be directed to the address cited for the agency-sponsor.

DOUGLAS J. CAMPION,
Patent Program Coordinator,
National Technical Information Service.

U.S. DEPARTMENT OF THE AIR FORCE
AF/JACP, 1900 Half St., SW., Washington, D.C. 20324

Patent 4,135,494. Over-Pressure Protection Device. Filed Mar. 9, 1977. Patented Jan. 23, 1979. Not available NTIS.

U.S. DEPARTMENT OF ENERGY
Assistant General Counsel for Patents
Washington, D.C. 20545

Patent application 244,080. Fuel Control. Filed Apr. 14, 1972.

Patent application 714,863. Cylindrical Radiant Energy Direction Devices With Refractive Medium. Filed Aug. 16, 1976.

Patent application 822,861. Twin Pack Hemodialyzer. Filed Aug. 8, 1977.

Patent application 839,238. Laser-Induced Separation of Hydrogen Isotopes in the Liquid Phase. Filed Oct. 4, 1977.

Patent application 841,775. Ceramic End Seal Design for High Temperature High Voltage Nuclear Instrumentation Cables. Filed Oct. 13, 1977.

Patent application 844,084. Combined Compress Air Storage, Low BTU Coal Gasification Power Plant. Filed Oct. 20, 1977.

Patent application 844,085. Solids Irradiator. Filed Oct. 20, 1977.

Patent application 844,086. CF Sub 4 Laser. Filed Oct. 20, 1977.

Patent 4,078,704. Coal Feed Lock. Filed Dec. 21, 1976. Patented Mar. 14, 1978. Not available NTIS.

Patent 4,086,323. Process for Removal of Sulfur Compounds From Fuel Gases. Filed June 21, 1977. Patented Apr. 25, 1978. Not available NTIS.

Patent 4,087,573. Adhesive Plasters. Filed Sept. 26, 1975. Patented May 2, 1978. Not available NTIS.

Patent 4,087,905. Method of Preparing a Powdered Electrically Insulative Separator for Use in an Electrochemical Cell. Filed Mar. 30, 1977. Patented May 9, 1978. Not available NTIS.

Patent 4,088,512. Quench-Age Method for the Fabrication of Niobium-Aluminum Superconductors. Filed Jan. 21, 1977. Patented May 9, 1978. Not available NTIS.

Patent 4,088,553. Method for Separation Boron Isotones. Filed June 12, 1974. Patented May 9, 1978. Not available NTIS.

Patent 4,090,875. Ductile Tungsten-Nickel-Alloy and Method for Manufacturing Same. Filed Oct. 1, 1973. Patented May 23, 1978. Not available NTIS.

Patent 4,091,077. Process for Recovering Filler From Polymer. Filed Aug. 12, 1977. Patented May 23, 1978. Not available NTIS.

Patent 4,091,196. Method for Reproducibly Preparing a Low-Melting High-Carbon Yield Precursor. Filed Jan 21, 1977. Patented May 23, 1978. Not available NTIS.

Patent 4,103,256. Azacoumarin Dye Lasers. Filed May 25, 1976. Patented July 25, 1978. Not available NTIS.

Patent 4,103,257. Azaquinolone Dye Lasers. Filed May 25, 1976. Patented July 25, 1978. Not available NTIS.

Patent 4,122,897. In Situ Gasification Process for Producing Product Gas Enriched in Carbon Monoxide and Hydrogen. Filed Dec. 28, 1977. Patented Oct. 31, 1978. Not available NTIS.

U.S. DEPARTMENT OF THE INTERIOR
Branch of Patents, 18th and C Sts., NW.,
Washington, D.C. 20240

Patent application 942,833. Froth Flotation of Insoluble Slimes From Sylvinite Ores. Filed Sept. 15, 1978.

Patent application 953,395. Process for Scavenging Iron From Tailings Produced by Flotation Beneficiation and for Increasing Iron Ore Recovery. Filed Oct. 23, 1978.

Patent application 954,026. Induced Air Flow Self-Cleaning Spray Nozzle. Filed Oct. 23, 1978.

Patent application 969,047. Precision Drafting Instrument. Filed Dec. 13, 1978.

Patent application 969,767. High Coercive Force Rare Earth Metal-Cobalt Magnets Containing Copper and Magnesium. Filed Dec. 15, 1978.

Patent application 969,768. Extraction of Tungsten From Ores. Filed Dec. 15, 1978.

U.S. DEPARTMENT OF THE NAVY
Assistant Chief for Patents, Office of Naval Research
Code 302, Arlington, Va. 22217

Patent application 003,181. High Performance Solar Still. Filed Jan. 15, 1979.

Patent application 815,327. Biopotential Movement Artifact Inhibiting System. Filed July 13, 1978.

Patent application 928,218. Pulse Generator Utilizing Superconducting Apparatus. Filed July 26, 1978.

Patent application 939,000. An Analog/Digital System for Evaluating Battery Characteristics. Filed Aug. 30, 1978.

Patent application 957,126. High Speed Frequency Tunable Microwave Filter. Filed Nov. 3, 1978.

Patent application 957,763. Diode Array Convolver. Filed Oct. 31, 1978.

Patent application 967,749. Surface Acoustic Signal Defader. Filed Dec. 6, 1978.

Patent application 970,584. Adaptive Slant Range Compensator for a Remote Optical Mapping System. Filed Dec. 18, 1978.

Patent 4,062,105. Method for Fabricating Ferroelectric Ultrasonic Transducers. Filed Dec. 20, 1976. Patented Dec. 13, 1977. Not available NTIS.

Patent 4,090,559. Heat Transfer Device. Filed Aug. 14, 1974. Patented May 23, 1978. Not available NTIS.

Patent 4,102,574. Method and Means of Monitoring the Quality of a Fluid Dielectric. Filed May 11, 1977. Patented July 25. 1978. Not available NTIS.

Patent 4,106,504. Portable Recompression Chamber With Air Scrubber. Filed Dec. 6, 1976. Patented Aug. 15, 1978. Not available NTIS.

Patent 4,106,910. Ras-Gas Dilution Device. Filed Aug. 16, 1977. Patented Aug. 15, 1978. Not available NTIS.

Patent 4,107,575. Frequency-Selective Loss Technique for Oscillation Prevention in Traveling-Wave Tubes. Filed Oct. 4, 1976. Patented Aug. 15, 1978. Not available NTIS.

Patent 4,109,062. Submersible Battery Apparatus. Filed Sept. 22, 1977. Patented Aug. 22, 1978. Not available NTIS.

Patent 4,109,997. Optical Sliprings. Filed Feb. 28, 1977. Patented Aug. 29, 1978. Not available NTIS.

Patent 4,110,977. Pyrogen Igniter Ramjet Ignition System. Filed June 13, 1977. Patented Sept. 5, 1978. Not available NTIS.

Patent 4,111,602. Deployable Rotor. Filed Jan. 31, 1977. Patented Sept. 5, 1978. Not available NTIS.

Patent 4,117,329. Room-Temperature, Thin-Film, PbS Photoconductive Detector Hardened Against Laser Damage. Filed Apr. 22, 1977. Patented Sept. 26, 1978. Not available NTIS.

Patent 4,122,412. Magneto-Optically Tuned Lasers. Filed Apr. 18, 1977. Patented Oct. 24, 1978. Not available NTIS.

Patent 4,123,697. Electrostatic High Potential System. Filed July 5, 1977. Patented Oct. 31, 1978. Not available NTIS.

Patent 4,123,728. Electrogenerated Chemiluminescent (ECL) Laser. Filed Nov. 1, 1976. Patented Oct. 31, 1978. Not available NTIS.

Patent 4,124,297. Ultrafast Scanning Spectrophotometer. Filed July 25, 1977. Patented Nov. 7, 1978. Not available NTIS.

Patent 4,124,657. Room Temperature Cured Elastomer. Filed Mar. 25, 1977. Patented Nov. 7, 1978. Not available NTIS.

Patent 4,130,821. Frequency-Agile Fire Control Radar System. Filed Apr. 8, 1977. Patented Dec. 19, 1978. Not available NTIS.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Assistant General Counsel for Patent Matters—
NASA Code GP–2, Washington, D.C. 20546

Patent application 6,008,207. Dual Bard Combiner for Horn Antenna. Filed Jan. 31, 1979.

Patent application 6,008,209. Multifrequency Broadband Horn Antenna. Filed Jan. 31, 1979.

Patent application 969,756. A Method of Making High Temperature Seals. Filed Dec. 15, 1978.

Patent 3,626,114. Thermomagnetic Recording and Magnetic Optic Playback System. Filed Mar. 10, 1969. Patented Dec. 7, 1971. Not available NTIS.

Patent 3,837,908. Manganese Bismuth Films With Narrow Transfer Characteristics for Curie-Point Switching. Filed Nov. 1, 1972. Patented Sept. 24, 1974. Not available NTIS.

Patent 4,134,683. Multispectral Imaging and Analysis System. Filed Mar. 5, 1976. Patented Jan. 16, 1979. Not available NTIS.

U.S. DEPARTMENT OF THE INTERIOR
Branch of Patents, 18th and C Sts., NW.,
Washington, D.C. 20240

Patent application 953,393. Process for Producing a Metastable Precursor Powder and for Producing Sialon From This Powder. Filed Oct. 12, 1978.

U.S. DEPARTMENT OF THE AIR FORCE
AF/JACP, 1900 Half St., SW., Washington, D.C. 20324

Patent 4,128,113. Double Plug Shuttle Valve. Filed Aug. 27, 1976. Patented Dec. 5, 1978. Not available NTIS.

Patent 4,128,305. Catadioptric Objective. Filed Apr. 14, 1977. Patented Dec. 5, 1978. Not available NTIS.

Patent 4,131,593. Low Infrared Emissivity Paints Comprising an Oxime Cured Silicone Binder. Filed Oct. 13, 1977. Patented Dec. 26, 1978. Not available NTIS.

Patent 4,132,988. Radar Instrusion Detection System. Filed Aug. 19, 1977. Patented Jan. 2, 1979. Not available NTIS.

Patent 4,135,169. Pre-TR High Power/Intermediate Power Stage Apparatus. Filed Mar. 10, 1977. Patented Jan. 16, 1979. Not available NTIS.

Patent 4,135,185. RF Loop Intruder Detection System. Filed Oct. 7, 1977. Patented Jan. 16, 1979. Not available NTIS.

Patent 4,135,296. Method of Joining a Fine Wire Filament to a Connector. Filed Aug. 19, 1977. Patented Jan. 23, 1979. Not available NTIS.

Patent 4,135,298. Deformable Heat Transfer Fin. Filed June 21, 1977. Patented Jan. 23, 1979. Not available NTIS.

U.S. DEPARTMENT OF AGRICULTURE
Research Agreements and Patent Branch, General Service Division, Federal Bldg., Agriculture Research Service Hyattsville, Md. 20782

Patent application 974,170. Preparation of Protein Concentrates From Whey and Seed Products. Filed Dec. 28, 1978.

Patent 4,136,169. Cross-Protective Fowl Cholera Bacterins. Filed Feb. 24, 1978. Patented Jan. 23, 1979. Not available NTIS.

U.S. DEPARTMENT OF ENERGY
Assistant General Counsel for Patents
Washington, D.C. 20545

Patent application 849,570. Wellbore Pressure Transducer. Filed Nov. 8, 1977.

Patent application 855,647. Directional Detector of Gamma Rays. Filed Nov. 29, 1977.

U.S. DEPARTMENT OF THE INTERIOR
Branch of Patents, 18th and C Sts., NW.,
Washington, D.C. 20240

Patent 4,090,135. Wireless FSK Technique for Telemetering Underground Data to the Surface. Filed June 29, 1976. Patented May 16, 1978. Not available NTIS.

Patent 4,098,866. Recovery of Uranium From Refractory Ores. Filed Apr. 15, 1977. Patented July 4, 1978. Not available NTIS.

Patent 4,104,132. Method for Eliminating Solution-Level Attack on Cathodes During Electrolysis. Filed July 22, 1977. Patented Aug. 1, 1978. Not available NTIS.

U.S. DEPARTMENT OF THE NAVY
Assistant Chief for Patents, Office of Naval Research
Code 302, Arlington, Va. 22217

Patent application 6,001,031. Refractory Passivated Ion-Implanted GaAs Ohmic Contacts. Filed Jan. 1, 1979.

Patent application 943,255. Universal Tow Target Adapter. Filed Sept. 15, 1978.

Patent application 943,894. Gyrotron Travelling-Wave Amplifier. Filed Sept. 19, 1978.

Patent application 952,021. Connector Receiver for Pontoon Causeways. Filed Oct. 16, 1978.

Patent application 962,406. Hydrophone Preamplifier and Calibration Circuit. Filed Jan. 5, 1978.

Patent application 973,053. Shaft and Bore Misalignment Measurement Tool. Filed Dec. 22, 1978.

Patent 4,108,400. Dual Mode Guidance System. Filed Aug. 2, 1976. Patented Aug. 22, 1978. Not available NTIS.

Patent 4,110,697. Digital Bypassable Register Interface. Filed Feb. 22, 1977. Patented Aug. 29, 1978. Not available NTIS.

Patent 4,110,715. Broadband High Pass Microwave Filter. Filed July 27, 1977. Patented Aug. 29, 1978. Not available NTIS.

Patent 4,112,394. Method and Means of Link Coupling With Separate Control of Link Reactance and Coupling Coefficient. Filed Jan. 3, 1977. Patented Sept. 4, 1978. Not available NTIS.

Patent 4,117,588. Method of Manufacturing Three Dimensional Integrated Circuits. Filed Jan. 24, 1977. Patented Oct. 3, 1978. Not available NTIS.

Patent 4,117,967. Solder Extractor Apparatus. Filed May 26, 1977. Patented Oct. 3, 1978. Not available NTIS.

Patent 4,126,033. Determination of Thermal Conductances of Bonding Layers in Infrared Photoconductor Arrays. Filed June 23, 1977. Patented Nov. 21, 1978. Not available NTIS.

Patent 4,128,774. N Cycle Gated Periodic Waveform Generator. Filed June 20, 1977. Patented Dec. 5, 1978. Not available NTIS.

Patent 4,131,392. Deployable Rotor. Filed Jan. 31, 1977. Patented Dec. 26, 1978. Not available NTIS.

Patent 4,135,454. Safing a Flueric Cartridge Initiator. Filed Sept. 14, 1977. Patented Jan. 23, 1979. Not available NTIS.

U.S. DEPARTMENT OF THE INTERIOR

Branch of Patents, 18th and C Sts., NW.,
Washington, D.C. 20240

Patent 4,080,419. Foam Injection Leaching Process for Fragmented Ore. Filed Dec. 10, 1976. Patented Mar. 21, 1978. Not available NTIS.

Patent 4,104,544. Current Limiting Circuit for Direct Current Power Supplies. Filed Mar. 16, 1977. Patented Aug. 1, 1978. Not available NTIS.

Patent 4,120,694. Process for Purifying a Titanium-Bearing Material and Upgrading Ilmenite to Synthetic Rutile With Sulfur Trioxide. Filed Sept. 6, 1977. Patented Oct. 17, 1978. Not available NTIS.

Patent 4,135,921. Process for the Preparation of Rare-Earth-Silicon Alloys. Filed Mar. 7, 1978. Patented Jan. 23, 1979. Not available NTIS.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Assistant General Counsel for Patent Matters—
NASA Code GP–2, Washington, D.C. 20546

Patent application 6,002,925. Method and Alloy for Making Electrical Connections to Conductive Thin Film. Filed Jan. 12, 1979.

Patent application 6,009,889. CCD Correlated Quadruple Sampling Processor. Filed Feb. 6, 1979.

Patent application 956,529. Cooled Echelle Grating Spectometer. Filed Oct. 31, 1978.

Patent application 969,757. Method and Technique for Installing Light-Weight Fragile, High-Temperature Fiber Insulation. Filed Dec. 15, 1978.

Patent application 974,292. Preparation of Monotectic Alloys Having a Controlled Microstructure by Directional Solidification Under Dopant-Induced Interface Breakdown. Filed Dec. 29, 1978.

Patent application 974,472. Thermal Barrier Pressure Seal. Filed Dec. 29, 1978.

Patent application 974,475. Digital Numerically Controlled Oscillator. Filed Dec. 29, 1978.

Patent 4,135,019. Low Density Bismaleimide-Carbon Microballoon Composites. Filed Mar. 16, 1977. Patented Jan. 16, 1979. Not available NTIS.

Patent 4,135,127. Direct Current Transformer. Filed Mar. 29, 1977. Patented Jan. 16, 1979. Not available NTIS.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Birmingham Public Library	(205) 254-2555
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	Sacramento: California State Library	(916) 322–4572
	Sunnyvale Patent Library*	(408) 736-0795
Colorado	Denver Public Library	(303) 573-5152 Ext. 223
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4519
Illinois	Chicago Public Library	(312) 269-2814
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Detroit Public Library	(313) 833-1458
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214
Nebraska	Lincoln: University of Nebraska-Lincoln, Love Library	(404) 472-3411
New Jersey	Newark Public Library	(201) 733-7740
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 790-6291
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Ohio	Cincinnati & Hamilton County Public Library	(513) 369-6969
	Cleveland Public Library	(216) 623-2932
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 242–7361 Ext. 258
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1226
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3128
	University Park: The Pennsylvania State Libraries	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 224
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 528-2957
Texas	Dallas Public Library	(214) 748-9071
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF APRIL 21, 1979

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	8-11-78
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines: Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	5-2-78
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, Treating Processes, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	7-6-78
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	3-20-78
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	12-1-77
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	11-2-77
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear and Reactors; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptograph; Laser Devices; Radioactive Materials; Power Metallurgy, Rocket Fuels.	2-3-78
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—N. ANSHER, Director. Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	6-1-78
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—A. L. SMITH, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	8-25-78
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	8-25-77
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	5-17-77
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—M. M. NEWMAN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	2-22-78
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	5-11-78
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—B. R. GRAY, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	4-7-78
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	1-30-78
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—G. M. FORLENZA, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Textiles; Apparel and Shoes; Sewing Machines; Machine Elements; Clutches.	12-20-77

Expiration of patents: The patents within the range of numbers indicated below expire during April 1979, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 3,027,553 to 3,031,668, inclusive
Plant Patents..... Numbers 2,135 to 2,142, inclusive

DEFENSIVE PUBLICATIONS

PUBLISHED AUGUST 7, 1979

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687. The abstracts of Defensive Publication applications are identified by distinctly numbered series and are arranged chronologically. The heading of each abstract indicates the number of pages of specification, including claims and sheets of drawings contained in the application as originally filed. The files of these applications are available to the public for inspection and reproduction may be purchased for 30 cents a sheet.

Defensive Publication applications have not been examined as to the merits of alleged invention. The Patent and Trademark Office makes no assertion as to the novelty of the disclosed subject matter.

T985,001
COLORATION PROCESS

Grahame M. Reade, Wheathampstead; William Clarke, Middleton, and Maurice Danby, Knutsford, all of England, assignors to Imperial Chemical Industries Limited, London, England

Filed Nov. 9, 1978, Ser. No. 958,997

Claims priority, application United Kingdom, Nov. 11, 1977, 47040/77

Int. Cl.[2] D06P *5/00*

U.S. Cl. 8—2.5 R

No Drawing. 18 Pages Specification

Water-impregnated textiles, especially of cellulose or wool, or mixtures of cellulose and wool with synthetic fibers and synthetic textiles, such as nylon and acrylics, particularly as assembled garments, are wet-transfer printed with a transferable printing design comprising a dyestuff which is reactive with the textile by heating the impregnated textile in contact with the design while maintained in a water-impervious enclosure comprising a polyester film or sheet, such as poly(ethylene terephthalate). The design is preferably applied to the polyester film or sheet which may be pretreated to facilitate coating with the transferable design. The pretreatment may comprise a wettable resin coating such as a cross-linked copolymer of acrylic acid, methacrylic acid or their glycidyl or lower alkyl esters.

Transfer printing materials useful in the wet-transfer printing process are also disclosed and include a supporting film or sheet of a synthetic thermoplastics linear polyester such as a film of biaxially oriented heat set poly(ethylene) terephthalate, and a transferable printing layer of a textile-reactive dyestuff applied to one or both surfaces of the film or sheet.

T985,002
SEAT BELT RETRACTOR BASE AND COVER

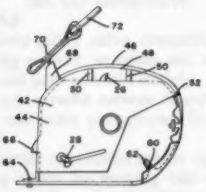
Robert L. Stephenson, Sterling Heights, Mich., assignor to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Continuation of Ser. No. 821,273, Aug. 3, 1977, abandoned. This application Jun. 16, 1978, Ser. No. 916,402

Int. Cl.[2] A62B *35/00*; B65H *75/48*

U.S. Cl. 242—107.4 R

2 Sheets Drawing. 10 Pages Specification



A seat belt retractor comprising a generally U-shaped frame comprising a central base portion and two upstanding flange portions attached to the sides of the base portion, each of the flange portions including an upper surface connecting two side surfaces, the upper surface being substantially flat; a shaft journalled for rotation in the flange portions; at least one ratchet wheel mounted on the shaft for rotation therewith and having a plurality of ratchet teeth along its outer circumference, the ratchet wheel being located adjacent to one of the flange portions and being positioned such that its outer circumference is above the height of the upper surface of the one flange portion, and cover means forming a protective cover at least around the upstanding flanges of the frame, the cover having inner and outer surfaces, the inner surfaces being provided with spacing means in contact with a portion of at least the upper surface of the one flange portion for spacing the inner surface of the cover from the outer circumference of the ratchet wheel, the spacing means further providing reinforcement to the cover to resist movement of the cover against the upper surface.

T985,003
SYNERGISTIC LIGHT STABILIZER BLENDS FOR POLY(VINYL CHLORIDE) POLYMERS

Eugene R. Bertozzi, Yardley, and Henry N. Paul, 3rd, Philadelphia, both of Pa., assignors to Thiokol Corporation, Newtown, Pa.

Continuation-in-part of Ser. No. 863,753, Dec. 23, 1977. This application Sep. 20, 1978, Ser. No. 944,120

Int. Cl.[2] C08K *5/57*

U.S. Cl. 260—45.75 S

No Drawing. 22 Pages Specification

Tin salts formed by the reaction of di lower alkyl or aryl tin oxides and dimercapto ethyl formal and similar dimercapto compounds of the general formula

wherein R is $-(CH_2)_m(OCH_2)_k-O-\{-(CH_2)_m-(OCH_2)_p-O-\}_n(CH_2)_m-$ wherein p is 0 or 1, m is 2 to about 6 and N is 0 to about 6 and R′ is lower alkyl of up to about 10 carbon atoms, or carbocyclic aryl containing one or two aromatic rings when combined with conventional tin based stabilizers show a synergistic light and heat stabilizing effect in poly(vinyl chloride) polymers.

T985,004
SYNERGISTIC ULTRAVIOLET LIGHT STABILIZER MIXTURES FOR MONO-OLEFIN POLYMERS

Henry N. Paul, 3rd, 538 E. Gravers La., Philadelphia, Pa. 19118

Continuation of Ser. No. 908,335, May 22, 1978, abandoned, which is a continuation of Ser. No. 849,907, Nov. 9, 1977, abandoned. This application Oct. 12, 1978, Ser. No. 950,892

Int. Cl.[2] C08K *5/37*

U.S. Cl. 260—45.7 S

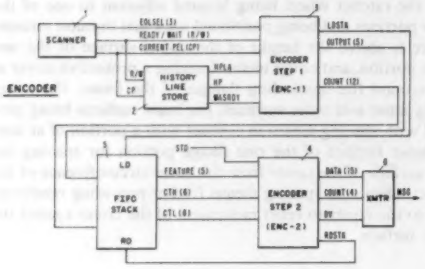
No Drawing. 25 Pages Specification

Polyolefins are stabilized against the degradative effects of ultraviolet light using mixtures of alkylene polysulfide polymers and conventional stabilizers such as hydroxy benzophenones, thiodipropionates and phenolic antioxidants.

T985,005
TWO-DIMENSIONAL IMAGE DATA COMPRESSION AND DECOMPRESSION SYSTEM

Gerald Goertzel, 7 Sparrow Cir., White Plains, N.Y. 10605, and Joan L. Mitchell, 1206 Main St., Peekskill, N.Y. 10566

Filed Oct. 16, 1978, Ser. No. 951,532
Int. Cl.[2] G06F *15/20*
U.S. Cl. 364—515
23 Sheets Drawing. 166 Pages Specification

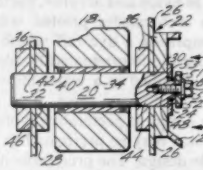


A dual-mode encoding and decoding procedure enables image data to be compressed optionally in one-dimensional (1D) mode or two-dimensional (2D) mode. In 1D mode, color transitions in the image are encoded as run length features only. In 2D mode, the transitions are encoded as vertical correlation features wherever possible, and where this is not possible, the transitions are encoded as run length features. The compression achieved by run length encoding in 2D mode may be enhanced in those instances where the "history line" which precedes the current scan line contains a transition located between points that are vertically aligned with the beginning and end points of the run currently being encoded. Run length counting is suspended for those pels in the current run that could have been referenced to the history transition if the run had ended with any of these pels, thereby enabling the run to be encoded as though it contained fewer pels than its actual length. Compression may be enhanced still further by dynamically interchanging the variable-length bit patterns respectively representing certain vertical correlation and run length prefix codes depending upon whether the preceding transition was encoded as a vertical correlation feature or a run length feature.

T985,006
RETAINING MEANS FOR PIVOT PIN

Erich E. Drochner, Bettendorf, Iowa, assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Oct. 30, 1978, Ser. No. 956,009
Int. Cl.[2] F16C *11/06;* F16D *1/12, 3/00*
U.S. Cl. 403—163
1 Sheets Drawing. 5 Pages Specification



Apparatus for pivotally connecting two relatively movable members has a pin having one end connectable with a retainer plate. Flat surfaces and shoulders formed on the one pin end respectively engage the plate and an aperture therein and with an end connected bolt and washer universally maintains the pin.

REISSUES

AUGUST 7, 1979

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

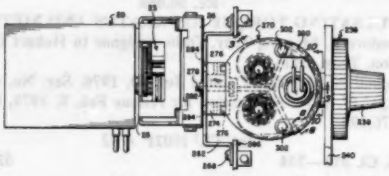
Re. 30,062
ELONGATED STRIP TYPE INDICATOR ARRANGEMENT FOR UHF TELEVISION TUNER

Alarico A. Valdettaro, Bloomington, Ind., assignor to Sarkes Tarzian, Inc., Bloomington, Ind.

Original No. 3,916,820, dated Nov. 4, 1975, Ser. No. 257,846, May 30, 1972. Application for reissue Nov. 4, 1977, Ser. No. 848,772

Int. Cl.[2] H03J *1/02, 5/04*

U.S. Cl. 116—243 **21 Claims**



15. In a UHF tuning mechanism of the type having a continuously variable main tuning shaft, rotation of which is effective selectively to receive signals from all seventy television stations in the UHF television band, the combination of a station selector shaft, gear means interconnecting said selector shaft and said main tuning shaft, detent means connected to said selector shaft for establishing a plurality of equally spaced detent positions for said selector shaft so that all of the stations in said UHF band may be selected by rotating said selector shaft more than one revolution, a movable mounted elongated strip of material bearing numbers corresponding to the assigned channels of each of the seventy UHF television stations, means defining a stationary single number viewing position at which only one of said numbers may be viewed at a time, driving means for moving said elongated strip past said viewing position, and means interconnecting said selector shaft and said driving means so that each UHF channel number on said elongated strip which corresponds to a detent position of said main tuning shaft is automatically viewable at said viewing position in response to rotation of said selector shaft.

Re. 30,063
HIGH PRESSURE SAFETY VALVE

Jesse H. Turner, Auburn, Ind.; Claud C. Hurd, Riverside, and Frank Fiedler, Jr., Rowland Heights, both of Calif., assignors to Essex International, Inc., Fort Wayne, Ind.

Original No. 4,026,314, dated May 31, 1977, Ser. No. 626,817, Oct. 29, 1975. Application for reissue Sep. 7, 1977, Ser. No. 831,303

Int. Cl.[2] G05D *16/06*

U.S. Cl. 137—116.5 **5 Claims**

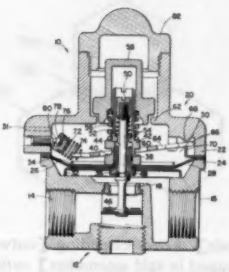
1. A high pressure safety valve, comprising:

a housing having an inlet, an outlet and a main passageway connecting said inlet and said outlet;

main valve means *movable between closed and open positions* disposed in said main passageway for controlling flow therethrough;

differential pressure responsive means operably connected to said valve means for moving said main valve means toward and away from the closed position in response to differentials in pressure between a reference pressure and the pressure at said outlet;

snap acting operator means comprising a pivoted arm member and overcentering spring biasing means operatively connected to said differential pressure responsive means for moving said main valve means from the closed position to the open position, and vice versa, with a snap action when the differential pressure responsive means moves *said main valve means* in a direction from the [close] *closed* position to the open position, and vice versa; and



relief valve means operated by said differential pressure responsive means for relieving the pressure at said outlet whenever said outlet pressure rises above a predetermined level and said main valve is *in said* closed *position.*

Re. 30,064
PROCESS FOR COLOR PHOTOGRAPHIC PROCESSING

Isao Shimamura, and Junkiti Ogawa, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Original No. 4,083,723, dated Apr. 11, 1978, Ser. No. 771,492, Feb. 24, 1977. Application for reissue Jul. 3, 1978, Ser. No. 921,677

Claims priority, application Japan, Feb. 24, 1976, 51-19215; Sep. 29, 1976, 51-117036

Int. Cl.[2] G03C *5/30*

U.S. Cl. 96—66.5 **11 Claims**

1. A process for color photographic processing, which comprises subjecting an imagewise exposed silver halide color light-sensitive material to a color development using a color developer containing;

(1) a p-phenylenediamine developing agent or derivative thereof and

(2) at least one organic compound having at least one phosphono group and at least one carboxy group in the molecule selected from the group consisting of 2-phosphonobutane-1,2,4-tricarboxylic acid, 1-phosphonopropane-1,2, 3-tricarboxylic acid, 1-phosphonobutane-2,3,4-tricarboxylic acid, 1,1-diphosphonopropane-2,3-dicarboxylic acid, 2-phosphonobutane-2,3,4-tricarboxylic acid and 2,2-diphosphonobutane-3,4-dicarboxylic acid.

Re. 30,065
NUCLEAR REACTOR

Andrew J. Anthony, Tariffville, and Edward A. Gruber, Windsor Locks, both of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

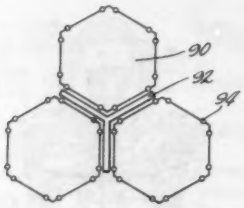
Original No. 3,366,546, dated Jan. 30, 1968, Ser. No. 511,138, Dec. 2, 1965. Application for reissue Dec. 27, 1977, Ser. No. 865,000

Int. Cl.[2] G21C *3/30*

U.S. Cl. 176—76 **9 Claims**

1. A core for a nuclear reactor comprising a plurality of longitudinally extending generally parallel fuel elements, said fuel elements being grouped into a plurality of fuel element assemblies and control rods interposed between certain of said

fuel element assemblies, said fuel element assemblies adjacent said control rods *each* including *a pair of spaced laterally extending support plates with said fuel elements being supported between said support plates and within the confines of a laterally extending polygon and further including longitudinally extending* guide rods[, said guide rods extending] generally parallel *and of a length coextensive* with said fuel elements, *said guide rods supported between said spaced support plates independently of said fuel elements and arranged in said assembly* with a *first* portion



[of said guide rods] *thereof* extending [outwardly from the fuel elements grouped in said assemblies] *outside of said polygon throughout the length of said guide rods* towards said control rods whereby said guide rods will prevent said control rods from engaging said fuel elements *and a second portion thereof extending inside of said polygon throughout the length of said guide rods, said guide rods thereby having a lateral dimension extending from outside said polygon to inside said polygon such that said guide rods are relatively rigid structural members.*

Re. 30,066

METHOD FOR SELECTIVELY REMOVING CHROMATES

Alfred W. Oberhofer, Downers Grove, Ill., assignor to Nalco Chemical Company, Oak Brook, Ill.

Original No. 3,414,510, dated Dec. 3, 1968, Ser. No. 709,182, Feb. 29, 1968. Application for reissue May 27, 1977, Ser. No. 801,075

Int. Cl.[2] C02B *1/62*

U.S. Cl. 210—30 R **11 Claims**

1. The method of selectively removing chromate ions from water containing [a large amount] *at least 1,000 parts per million* of total dissolved solids which comprises *adjusting the pH of the water being treated to a value from about 3.0 to about 5.0,* acidifying a weakly basic anion exchange resin *in the macroporous form* and thereafter contacting said water with the acidified resin to cause selective removal of chromate ions from said water.

Re. 30,067

IMINOIMIDAZOLIDINEDIONE AND PARABANIC ACID POLYMERS CONTAINING IMIDE GROUPS

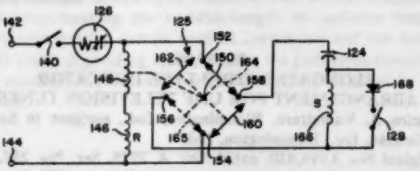
Tad L. Patton, Baytown, Tex., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Original No. 3,933,758, dated Jan. 20, 1976, Ser. No. 409,964, Oct. 26, 1973. Application for reissue Nov. 2, 1977, Ser. No. 847,936

Int. Cl.[2] C08G *18/00*

U.S. Cl. 525—419 **15 Claims**

1. As a composition of matter a new class of polymers [which are] *selected from the group of* iminoimidazolidinedione polymers containing imide groups [or their hydrolysis



derivatives, which are parabanic] *and iminoimidazolidinedione-parabanic* acid polymers containing imide groups.

Re. 30,068

PULSATING TORQUE APPARATUS AND METHOD

Theodore F. Meyers, Troy, Ohio, assignor to Hobart Corporation, Troy, Ohio

Original No. 3,970,907, dated Jul. 20, 1976, Ser. No. 461,638, Apr. 17, 1974. Application for reissue Feb. 8, 1978, Ser. No. 876,195

Int. Cl.[2] H02P *1/42*

U.S. Cl. 318—744 **32 Claims**

1. A waste disposer device comprising:

a substantially hollow cylindrical stator member;

a rotor member contained within said stator member and defining therewith a receptable for receiving waste material, said rotor and stator members including cooperating teeth members;

means including an induction motor for driving said rotor member;

first control means for generating unidirectional rotation in said means for driving;

second control means including means for simultaneously applying alternating and direct current to said means for driving for generating rapidly fluctuating bidirectional rotational movement in said means for driving, to provide disintegrating action between said rotor and said rotor members.

Re. 30,069

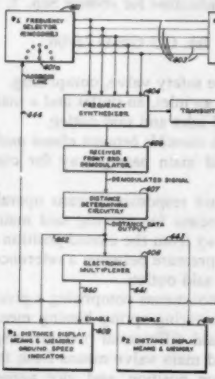
MULTIPLE RANGING DME

Wayne L. Miller, Stanhope, N.J., assignor to The Cessna Aircraft Corporation, Wichita, Kans.

Original No. 4,035,801, dated Jul. 12, 1977, Ser. No. 646,817, Jan. 6, 1976. Application for reissue May 10, 1978, Ser. No. 904,727

Int. Cl.[2] G01S *9/04*

U.S. Cl. 343—12 R **20 Claims**



16. A method for time multiplexing a DME transmitter-receiver between [two] *a plurality of* selected channels corre-

sponding to [two] *different* ground stations and [two] *different* ground stations and [two] *a like plurality of* display-memory corresponding thereto, comprising the steps of

selecting both [two] *plurality of* channels, causing said DME to operate on one of said [two] *plurality* channels,

displaying the distance data output of the DME on said one channel on the display-memory means corresponding thereto,

when said distance data output occurs, switching said DME to operate on [the other] *another of said* [two] *plurality of* channels,

displaying the distance data output on said other channel on the display-memory means corresponding thereto,

and when said distance data output on said other channel occurs switching said DME back to operate on said one channel.

PLANT PATENTS

GRANTED AUGUST 7, 1979

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,445

IMPATIENS PLANT—SENECA

John J. Ryan, 39877 Sundale Dr., Fremont, Calif. 94538

Filed Jul. 3, 1978, Ser. No. 921,888

Int. Cl.[2] A01H *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct form of Impatiens plant as described and illustrated, known by the cultivar name SENECA, and particularly characterized by its dark variegated foliage; its smaller, yet darker candy striping of a white flower; its more open growth habit; its spreading, yet stiff growth; and its floriferousness.

4,446

ORCHID PLANT

Douglas R. Allen, Jacksonville, Fla., assignor to Fort Caroline Orchids, Inc., Jacksonville, Fla.

Filed Jun. 19, 1978, Ser. No. 917,027

Int. Cl.[2] A01H *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct variety of Brassolaeliocattleya orchid plant substantially as herein shown and described characterized particularly as to novelty by the unique combination of a substantially concolor green flower, abundant year around flower production, with flowers being well displayed and of very heavy substance, lasting for about a full month in a cool atmosphere, and the flower having a heavy citron scent.

4,447

MINIATURE ROSE PLANT

Ralph S. Moore, 2519 E. Noble Ave., Visalia, Calif. 93277

Filed Aug. 21, 1978, Ser. No. 935,617

Int. Cl.[2] A01H *5/00*

U.S. Cl. Plt.—8 **1 Claim**

1. A new and distinct variety of miniature rose plant of hardy, dwarf, bushy, rounded, much branched habit, substantially as illustrated and described characterized by buds and flowers which are (1) clear medium yellow in color, the buds and flowers resembling Yellow Jewel (miniature — U.S. Plant Pat. No. 3,827) in size and shape and (2) the bud (sepals) being well covered with short moss, said moss being soft to the touch and giving off a lemon-like fragrance when rubbed or brushed; and further characterized by a plant which is vigorous and compact, easy to propagate from soft wood cuttings or by budding, with an abundance of flowers borne singly or several to the stem in loose clusters.

PLANT PATENTS

GRANTED AUGUST 7, 1956

PATENTS

GRANTED AUG. 7, 1979

ERRATA

For CLASS	See PATENT NO.
065–002	4,163,370
414–697	4,163,498
414–411	4,163,499
350–003.72	4,163,542
406–012	4,163,582
406–198	4,163,583
358–113	4,163,602
358–287	4,163,605
418–236	4,163,635
415–006	4,163,636
435–174	4,163,691
435–254	4,163,692
546–084	4,163,745
428–378	4,163,754
585–431	4,163,761
525–067	4,163,762
525–290	4,163,763
525–002	4,163,764
525–314	4,163,765
525–230	4,163,766
525–534	4,163,834
331–094.5 H	4,163,976
343–715	4,163,981
362–358	4,163,998
365–003	4,164,026
365–015	4,164,027
365–020	4,164,028
365–036	4,164,029
365–162	4,164,030
365–233	4,164,031

4,163,292

HIP PROSTHESIS

James E. Averett, Jr., 3612 Castlegate Dr., NW., Atlanta, Ga. 30327

Filed Nov. 21, 1977, Ser. No. 853,451

Int. Cl.[2] A61F *1/24*

U.S. Cl. 3—1.913 5 Claims

1. A hip prosthesis comprising a trochanteric enlargement having two right angular surfaces forming a flat base and side wall on the enlargement, an angled neck and ball head projecting above and to one side of the trochanteric enlargement, and an elongated stem of comparatively small cross section extending from the base of the trochanteric enlargement and having a flat side face in a common plane with said side wall of the trochanteric enlargement, said enlargement having two additional side walls extending substantially parallel to each other and at right angles to said first side wall, the upper portions of said additional side walls being joined by an arched portion, a plurality of spaced openings extending through said first side wall and a plurality of correspondingly spaced openings extending through each of said additional side walls and intersecting said first openings.

4,163,293

FLUSHING CISTERN

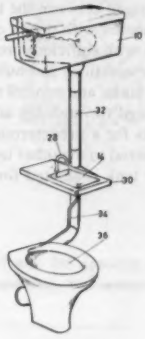
Ernest P. Basterfield, 22 High Rd., Eastleigh, Edenvale, Transvaal, South Africa

Filed Oct. 4, 1977, Ser. No. 839,364

Int. Cl.[2] A47K *4/00*

U.S. Cl. 4—3 3 Claims

1. A flushing toilet comprising: a cistern, a lid on the cistern, a valve controlled inlet means to flow water into the cistern, including a downpipe in the cistern and through which water enters the cistern, an outlet from the cistern, and a pan to receive water from the outlet, characterised by a bypass pipe inserted into the downpipe, said bypass pipe being smaller in outside diameter than the inner diameter of the downpipe, an extension of the bypass pipe to conduct water from the bypass



pipe and discharge it into the basin, and a vent in the basin for water to drain from it.

4,163,294

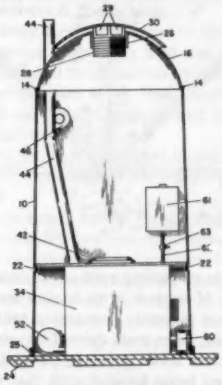
TOILET FACILITY

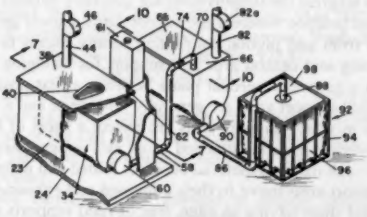
David D. Patterson, 142 Bradford, Seward, Nebr. 68434

Filed Nov. 18, 1977, Ser. No. 852,622

Int. Cl.[2] A47K *11/02*

U.S. Cl. 4—111 21 Claims





1. A toilet facility comprising an enclosure; first and second tanks, each being capable of holding liquid waste material therein, one of the tanks being located in the enclosure such that it is capable of receiving waste material from a person in

the enclosure; first and second air conduits leading into the first and second tanks, respectively, and having portions located low enough in their respective tanks to be submerged in the liquid waste material within the tanks, the submerged portions of the conduits having apertures therein, the first and second air conduits being separated sufficiently to prevent liquid waste material from transferring between the tanks by way of the air conduits; means connected with the air conduits for forcing air through the conduits with sufficient pressure to enable the air to escape through the apertures and bubble through the liquid waste material in the tanks; and control means for insuring that pressurized air is forced through the air conduit leading into the other of the tanks for a predetermined time after the last addition of waste material to the other tank, whereby the waste material in the other tank is aerated for at least the predetermined time.

4,163,295

POOL COVER

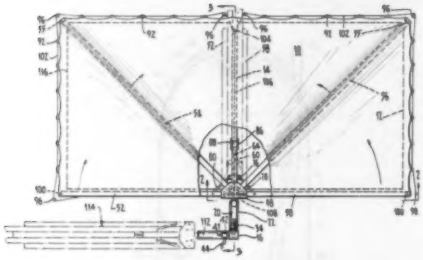
Johann Schütz, 11 Willsmere Rd., Kew, Victoria, 3101, Australia

Filed Jul. 25, 1977, Ser. No. 818,861

Claims priority, application Australia, Jul. 26, 1976, PC6762

Int. Cl.[2] E04H *3/19*; E04F *10/00*

U.S. Cl. 4—172.14 **12 Claims**



1. A collapsible swimming pool cover comprising: a central arm; a plurality of support arms having inner ends and free outer ends; means pivotally connecting said support arms at locations near the inner ends thereof to said central arm for swinging movement about generally parallel axes, said pivotal connecting means being located such that said support arms are swingable in generally the same plane between a collapsed position wherein the support arms are generally parallel and an expanded position wherein the support arms extend generally radially from said pivotal connecting means, means pivotally connecting said central arm to a support for swinging movement in a generally vertical plane between a first position in which said support arms are generally horizontal and a second position in which support arms are raised; a sheet of flexible pool-covering material attached to all said support arms in a manner such that said material becomes folded and unfolded as said support arms move to their collapsed and expanded positions, said sheet having an edge, free of rigid supports extending between the free outer ends of adjacent support arms; first power transmission means for swinging said central arm between its first and second positions; and second power transmission means for moving said support arms between their collapsed and expanded positions.

4,163,296

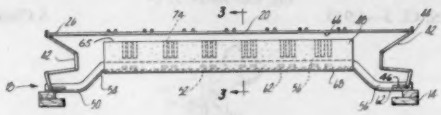
MATTRESS FOUNDATION EMPLOYING SPRINGS AND COOPERATING FOAM BODIES

John P. Kitchen, Georgetown, and David W. Samuels, Lexington, both of Ky., assignors to Hoover Universal, Inc., Saline, Mich.

Filed Feb. 6, 1978, Ser. No. 875,203

Int. Cl.[2] A47C *23/03*

U.S. Cl. 5—255 **5 Claims**



1. In a box spring assembly having a generally rectangular horizontally disposed frame which includes side and end rails, a wire grid comprising a network of wires arranged in a horizontal plane disposed a predetermined distance above said frame, selected ones of said wires extending transversely of said frame, a plurality of spring end portions arranged in a supporting relation with said grid and supported on said frame, a plurality of transverse cross rails secured to and extending between said side rails, and foam means supported on said cross rails and underlying said grid so as to provide yieldable support for said grid on said cross rails when said grid is subjected to bedding loads, said foam means being located in general alignment with at least some of said transversely extending wires so as to be engaged thereby when a bedding load is applied to said grid.

4,163,297

MATTRESS

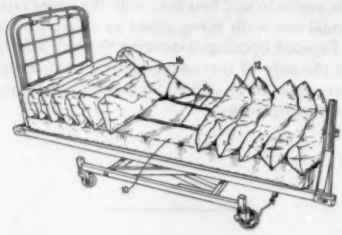
Otto W. Neumark, Cheshire, England, assignor to Beaufort Air Sea Equipment Limited, Lancashire, England

Filed Jul. 6, 1977, Ser. No. 816,090

Claims priority, application United Kingdom, Jul. 6, 1976, 27959/76

Int. Cl.[2] A47C *27/00*

U.S. Cl. 5—446 **9 Claims**



1. A bed mattress comprising a longitudinally-extending support; a selected number of small pillow-like elements positioned on said support; and connection means for quick releasably connecting said elements to said support, each element comprising an envelope formed by a flexible membrane defining an internal volume and granular material filling the internal volume to not more than 75% of its maximum capacity, said elements having first spaced-apart components of said connection means for quick releasably securing said elements at longitudinal edges thereof to second components of said connection means associated with said support, said elements being positioned in spaced side-by-side relationship to provide a predetermined limited amount of support for each other and to provide full support for at least part of a body of a user, said elements being adapted to be collectively deformed by the body until their respective internal volumes are fully occupied

by said granular material, said second components of said connection means being formed as spaced-apart members extending parallel to the longitudinal axis of the support.

4,163,298

DYEING OF PILE FABRICS

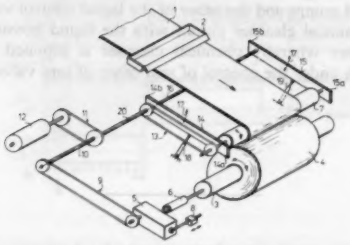
Manfred Schuierer, Michelstadt, Fed. Rep. of Germany, assignor to Bruckner Apparatebau GmbH, Erbach, Fed. Rep. of Germany

Filed Sep. 11, 1978, Ser. No. 940,909

Claims priority, application Fed. Rep. of Germany, Oct. 21, 1977, 2747347

Int. Cl.[2] D06B *1/06, 23/00*

U.S. Cl. 8—151 **14 Claims**



1. In a method of cold dyeing carpet pile fabric wherein dye liquor is applied to the pile side of the fabric in an amount between 150% and 300% of the fabric weight, followed by coiling the fabric into a roll, the improvement comprising coiling the fabric under tension which is greater than about 90% of the coiling tension at which such liquor begins to emerge from the roll and which limits the quantity of such liquor emerging from the roll to not more than 5% of the quantity of liquor applied.

8. In apparatus for dyeing a web of carpet pile fabric having means for applying to the pile side of said fabric dye liquor in an amount between about 150% and 300% of the weight of said fabric, a mandrel about which said web may be coiled, and means for driving said mandrel to coil said web under tensile force into a roll with the pile side of said fabric inwards, the improvement comprising means for adjusting the tensile force applied on the roll to a magnitude greater than 90% of that required to cause said liquor to emerge from said roll but which precludes more than about 5% of said liquor emerging from said roll.

4,163,299

PORTABLE GOLF BALL WASHER

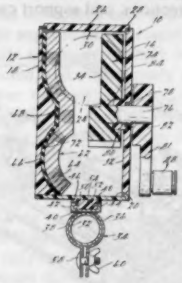
Alex J. Duda, 1704 S. Pennsylvania, Lansing, Mich. 48910

Filed Feb. 27, 1978, Ser. No. 881,558

Int. Cl.[2] A63B *47/04*

U.S. Cl. 15—21 A **2 Claims**

1. A portable golf ball washer comprising, in combination, a housing having a peripheral wall and spaced end walls defining a cylindrical chamber having a longitudinal axis, said peripheral wall defining an opening communicating with said chamber, ball scrubbing means disposed in said chamber adjacent one of said end walls, said ball scrubbing means being of generally concave, hemi-toroidal configuration and including a plurality of bristles having the free ends thereof projecting into said chamber and disposed on a segment of an imaginary hemi-torus having an inside surface with a radius of curvature substantially less than the radius of curvature of a golf ball, a manually actuatable drive member including a concave drive surface of generally semi-cylindrical configuration and rotatable in one direction about said axis to impel a golf ball in an orbital path around the longitudinal axis of said chamber and in engagement with said scrubbing means while simultaneously rotating said ball about random axes of said ball, said manually actuatable drive member also including a convex cam surface of generally involute configuration and rotatable in the opposite direction about said axis for ejecting said ball from said chamber through said opening, and removable cap means for closing said opening.



4,163,300

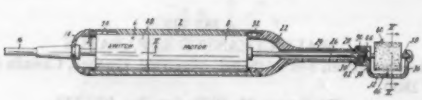
ELECTRIC TOOTHBRUSH

Hugh D. Quint, Rte. #2, Box 90 C, Osceola, Mo. 64776

Filed Mar. 1, 1978, Ser. No. 882,368

Int. Cl.[2] A46B *13/02*

U.S. Cl. 15—23 **5 Claims**



1. An electric toothbrush comprising:

a. an elongated body member adapted to serve as a handle whereby the device is manually held and manipulated,

b. a generally cylindrical brush carried by said body member at one end thereof, said brush being disposed generally coaxially with said body member and being mounted thereon for rotation about its axis,

c. a reversible electric motor mounted in said body member and operable to rotate said brush selectively in opposite directions, and

d. reversing switch means carried by said body member and operable to reverse the direction of rotation of said motor, said reversing switch means being operable responsively to gravity-induced movement of an element thereof to cause respectively opposite directions of said motor depending on whether said body member is held in a position with its axis inclined upwardly toward said brush, or downwardly toward said brush.

4,163,301

TUNNEL OR LIKE WALL CLEANING MACHINE

Kenneth E. Griffin, 6304 204th SW., Lynnwood, Wash. 98036

Filed Jul. 11, 1978, Ser. No. 923,577

Int. Cl.[2] A47L *1/38*

U.S. Cl. 15—50 R **7 Claims**

1. A cleaning apparatus adapted to clean those portions of a tunnel wall or the like which are located behind railing means typically placed along a walkway beside the wall, said apparatus comprising:

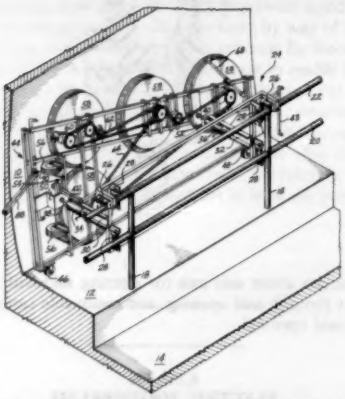
guidance carriage means adapted to engage said railing means and to be moved therealong;

support carriage means;

surface cleaning means rotationally secured to said support carriage means;

drive means for rotating said surface cleaning means; and

biasing means, connected between said guidance carriage means and said support carriage means, for urging said guidance carriage means and said support carriage means in opposite directions, said support carriage means in turn



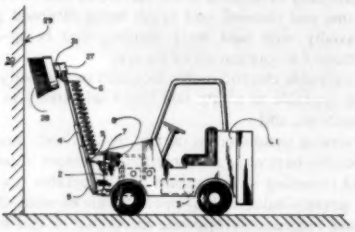
urging said surface cleaning means into contact with said wall, and said guidance carriage means being urged by said biasing means against said railing means which provides horizontal support for said guidance carriage means.

4,163,302

WALL CLEANING APPARATUS

Vincent Iaboni, 8469 Albanel, Montreal, Quebec, Canada (H1P 2K9)

Filed Aug. 28, 1978, Ser. No. 937,323
Int. Cl.[2] A47L *11/38*
U.S. Cl. 15—50 R **1 Claim**



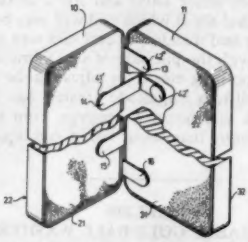
1. Wall cleaning apparatus, comprising
a wheeled powered vehicle having a front and sides;
a hydraulically controlled telescopic main boom having spaced opposite first and second ends, said main boom being mounted at its first end on the vehicle and adjustable in length from the vehicle;
a pair of hydraulically controlled directional control cylinders and pistons each having spaced opposite first and second ends, each of said control cylinders being mounted at its first end on a corresponding side of the vehicle and affixed at its second end to the main boom;
a hydraulic pump in the vehicle;
a hydraulic fluid reservoir in the vehicle;
a plurality of control valves in the vehicle;
a hydraulic duct system connecting the hydraulic fluid reservoir, the main boom, the directional control cylinders and pistons, the hydraulic pump and the plurality of control valves in a hydraulic circuit in a manner whereby the length and direction of said main boom relative to the vehicle are controlled via said control valves;
an electric motor mounted on the main boom at the second end thereof;
a cleaning brush coupled to and driven by the motor for rotatably brushing the surface of a wall;
a liquid housing mounted on the brush;
a pair of liquid pumps;
a water tank having water therein;
a chemical cleanser tank having chemical cleanser therein;
a pair of liquid control valves; and
a liquid duct system having one branch connecting the water tank, one of the liquid pumps and one of the liquid control valves in a water circuit with the liquid housing in a manner whereby water is supplied to the brush under the control of said one of said valves and another branch connecting the chemical cleanser tank, the other of the liquid pumps and the other of the liquid control valves in a chemical cleanser circuit with the liquid housing in a manner whereby chemical cleanser is supplied to the brush under the control of said other of said valves.

4,163,303

HINGE STRUCTURE

Gary D. Hanna, Toronto, Canada, assignor to G. D. Hanna Incorporated, Don Mills, Canada

Filed Oct. 4, 1977, Ser. No. 839,268
Claims priority, application Canada, Sep. 13, 1977, 286742
Int. Cl.[2] E05D *5/06, 9/00*
U.S. Cl. 16—135 **6 Claims**

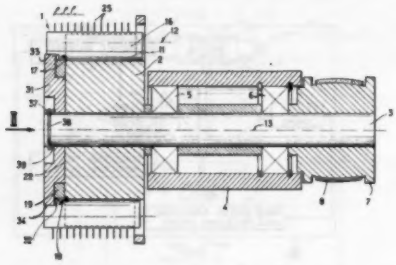


1. A hinge structure for hingedly securing first and second structural elements to permit movement thereof, one relative to the other through substantially 360°, each of said elements having a pair of corresponding sides, wherein:
said hinge comprises a relatively thin, wide band of substantially non-extensible material having opposite sides;
a first one of said hinge sides is releasably securable to a first one of said structural element surfaces and a second one of said hinge sides is releasably securable to a second one of said second structural sides, to hold said structural elements in at least an adjacent abutting relationship; and
a pair of hook and loop filamentous fastening elements is secured one to one end of said hinge on a first side thereof and one to a second end of said hinge on the second side thereof, said hook and loop filamentous fastening elements being adapted to engage with and disengage from selective portions of corresponding hook and loop filamentous surfaces on corresponding opposed surfaces of said first and second structural members.

4,163,304
ROTARY CYLINDER FITTED WITH NEEDLES OR TEETH FOR THE TREATMENT OF SLIVERS OF TEXTILE FIBERS

Regis Laflaquiere; Radé Janousek, and René Faessler, all of Mulhouse, France, assignors to Societe Alsacienne de Constructions Mecaniques de Mulhouse, France

Filed Dec. 6, 1977, Ser. No. 857,940
Claims priority, application France, Dec. 16, 1976, 76 37883
Int. Cl.[2] D01G *15/28*
U.S. Cl. 19—97 **7 Claims**



1. A cylinder for the treatment of textile fibers, especially for separating the fibers of slivers employed in open-end spinning, comprising:

a rotary cylinder body having an axis;

a plurality of longitudinal bars mounted around the periphery of said cylinder, for pivotal movement in said cylinder about axes which are parallel with the cylinder axis;

needles or teeth, rigidly fixed on a portion of the surface of each of said bars, projecting outwardly of said cylinder;

angular positioning means on each of said bars;

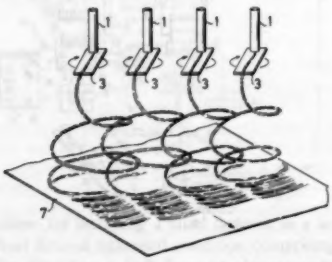
plate means carried by said cylinder; and

mating locking means carried by said plate means and engaging said angular positioning means to lock said bars angularly in said cylinder.

4,163,305
PROCESS AND DEVICE FOR THE MANUFACTURE OF NON WOVEN WEBS FROM FILAMENTS

Valentin Semjonow, Hofheim, and Jürgen Foedrowitz, Hochheim, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 19, 1975, Ser. No. 642,400
Claims priority, application Fed. Rep. of Germany, Dec. 21, 1974, 2460755
Int. Cl.[2] D01G *25/00;* D04H *3/02*
U.S. Cl. 19—299 **25 Claims**



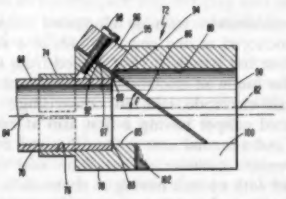
1. The process for the manufacture of non-woven webs from filaments collected on a moving surface by laying down said filaments on the moving surface in the form of conic spread sections, which method comprises deflecting and spreading out the filaments of a plurality of bundles of filaments to form filament veils laid down on said moving surface by continuously deflecting said bundles of filaments against one side only of associated filament deflectors, each deflector having a plane surface located at an angle to its associated bundle of filaments defining said one side and against which its associated bundle of filaments is deflected, and continuously rotating said deflectors with their plane surfaces at an angle to said filaments whereby the filaments in the bundles are deflected, dispersed and spread apart from one another into smaller bundles and individual fibers laid down on said moving surface.

16. In a device for the manufacture of non-woven webs from filaments collected on a moving surface by laying down said filaments on the moving surface the improvement comprising at least one rotatable deflector positioned to contact a filament bundle on one side only to deflect the bundle and disperse and spread out the filaments therein from one another into smaller bundles and individual filaments, said deflector having a flat planar deflecting surface and means for rotating said deflector continuously through 360° for forming conic spread apart filament sections deposited on said moving surface.

4,163,306
BOUNCE CRIMPER OUTLET APPARATUS

James H. Turner, Severn, Md., assignor to Chevron Research Company, San Francisco, Calif.

Filed Sep. 14, 1977, Ser. No. 833,373
Int. Cl.[2] D02G *1/16*
U.S. Cl. 28—254 **4 Claims**



1. In apparatus for bounce crimping a multi-filament yarn of synthetic resinous material having

draw rolls for delivering the yarn to be crimped at a predetermined speed;

a yarn texturizing housing having a yarn inlet for receiving an elongated multi-filament yarn, a fluid outlet aligned with the yarn inlet through which fluid is exhausted from the housing, a fluid inlet for receiving a yarn forwarding fluid, a channel extending between the yarn inlet and the fluid outlet through which yarn and the fluid pass during texturizing, and a lateral yarn outlet communicating with the channel and defining an exit from the channel for texturized yarn;

means for supplying a heated compressible fluid, communicating with the channel and operable to draw the multi-filament yarn into the yarn inlet of the housing; and

a foraminous surface positioned across the channel between the lateral yarn outlet and the fluid outlet, the heated fluid further serving to hurl the yarn against the foraminous surface to axially compress and crimp the yarn filaments and bounce the multi-filament yarn through the lateral yarn outlet;

an improvement comprising an outlet means operatively connected to said lateral yarn outlet for consolidating the yarn issuing therefrom, said outlet means including:

a restrictor assembly having a longitudinal bore and an inclined spring finger partially blocking the bore to provide a resistance to yarn movement out of the discharge end of said bore, said restrictor assembly also being provided with means for bypassing the spring finger and freely permitting rearward yarn movement past the spring

finger when the yarn is pulled rearwardly by said draw rolls, said means for bypassing including a longitudinal slot positioned opposite the spring finger and extending from a first position upstream of the spring finger to a second position downstream of the spring finger.

4,163,307

DEVICE FOR TENSIONING CORONA-DISCHARGE ELECTRODE ELEMENTS

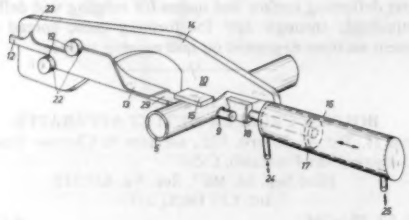
Klaus Papendick, Langen, and Lothar Peter, Rodenbach, both of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jan. 14, 1977, Ser. No. 759,271

Claims priority, application Fed. Rep. of Germany, Jan. 30, 1976, 2603514

Int. Cl.[2] H01J *9/06*

U.S. Cl. 29—25.19 **4 Claims**



1. The combination with an elongated corona-discharge electrode, anchored at one end to a bar, in a support frame having another bar parallel to but spaced from the first-mentioned bar, for use in an electrostatic precipitator, of a tool for tensioning said electrode, said tool comprising:

an elongated caliper having a first arm at one end of the caliper and a second arm at the other end of the caliper;

a fluid-pressure cylinder mounted on said first arm and provided with a piston having an abutment bearing against said other bar of said frame perpendicularly thereto, said cylinder extending parallel to said electrode;

an engaging member on one of the arms of said caliper engaging and entraining an unanchored opposite end of said electrode for tensioning same against said other bar;

positioning means on said second arm engaging said electrode for orienting said caliper relative to said electrode and vice versa;

a laterally extending bracket fixed to said caliper for orienting said caliper relative to said other bar in a plane generally perpendicular thereto; and

means for supplying fluid to said cylinder under pressure whereby said abutment is pressed against said other bar and said electrode is tensioned in accordance with the pressure applied to said cylinder.

4,163,308

DEFLECTION YOKE ASSEMBLY POSITIONING DEVICE

Tutomu Tawa, Yokohama, and Hiroshi Furukawa, Kamakura, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 7, 1978, Ser. No. 884,238

Claims priority, application Japan, Jun. 24, 1977, 52-74344; Jul. 25, 1977, 52-88387

Int. Cl.[2] H01J *9/44*

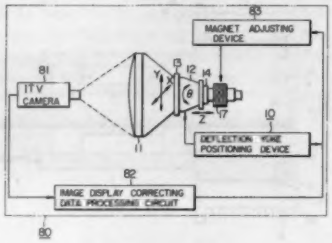
U.S. Cl. 29—25.19 **4 Claims**

1. A device for positioning a deflection yoke assembly on a cathode-ray tube comprising:

(a) first oscillating means comprising grasping means including a plurality of rollers for rotatably grasping the deflection yoke assembly in such a relation that the center of the fixing portion of the deflection yoke assembly is located on a horizontal axis, and causing controlled vertical oscillating movement of the opening portion of the deflection yoke assembly around said center of said fixing portion;

(b) rotating means associated with said first oscillating means for causing controlled rotating movement of the deflection yoke assembly grasped by said first oscillating means around the axis of the deflection yoke assembly;

(c) second oscillating means for supporting said first oscillating means in such a relation that said center of the fixing portion of the deflection yoke assembly grasped by said first oscillating means is located on a vertical axis, and



turning said first oscillating means around said vertical axis thereby causing controlled horizontal oscillating movement of the opening portion of the deflection yoke assembly around said center of said fixing portion; and

(d) sliding means carrying said second oscillating means thereon for causing controlled sliding movement of said second oscillating means in the axial direction of the neck portion of the cathode-ray tube thereby causing controlled sliding movement of the deflection yoke assembly grasped by said first oscillating means in the axial direction of the neck portion of the cathode-ray tube.

4,163,309

ARRANGEMENT FOR MOUNTING COMPONENTS ON A CARRIER BOARD AND METHOD OF INDICATING MOUNTING LOCATIONS

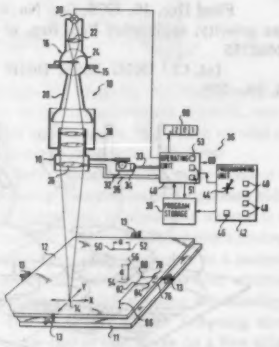
Gerd Stückler, Finkenweg 2, Brunnthal, Fed. Rep. of Germany (8011)

Filed Nov. 16, 1977, Ser. No. 851,830

Claims priority, application Fed. Rep. of Germany, Apr. 14, 1977, 2716548

Int. Cl.[2] H05K *13/04*

U.S. Cl. 29—407 **7 Claims**



1. A method of indicating at least one mounting location including a plurality of mounting spots spaced on a surface which comprises:

(a) projecting a luminous dot on said surface;

(b) moving the projected dot sequentially and repeatedly between the mounting spots to be indicated; and

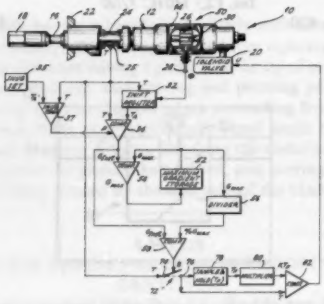
(c) changing the direction of movement of said dot in each of said spots.

4,163,310

TIGHTENING SYSTEM

Jerry A. Sigmund, Willow Grove, Pa., assignor to SPS Technologies, Inc., Jenkintown, Pa.

Filed Dec. 29, 1976, Ser. No. 755,409
Int. Cl.[2] B25B *23/14*
U.S. Cl. 29—407 **38 Claims**



15. A system for installing a fastener which is capable of generating a mating internal thread in a workpiece hole to a final desired tightened condition comprising:

means for detecting a thread-forming characteristic of the fastener; and

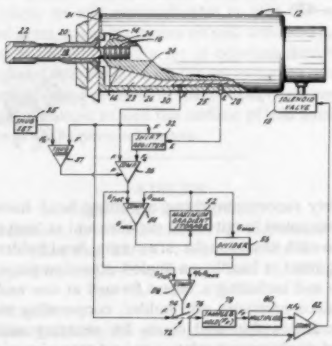
means responsive to said thread-forming characteristic and at least one known characteristic of the fastener for determining the final desired tightened condition.

4,163,311

TIGHTENING SYSTEM FOR BLIND FASTENERS

Jerry A. Sigmund, Willow Grove, Pa., assignor to SPS Technologies, Inc., Jenkintown, Pa.

Filed Feb. 28, 1977, Ser. No. 772,411
Int. Cl.[2] B25B *23/14*
U.S. Cl. 29—407 **43 Claims**



28. A system for installing a blind fastener in a workpiece hole to a final desired tightened condition comprising:

means for detecting a bulb-forming characteristic of the blind fastener; and

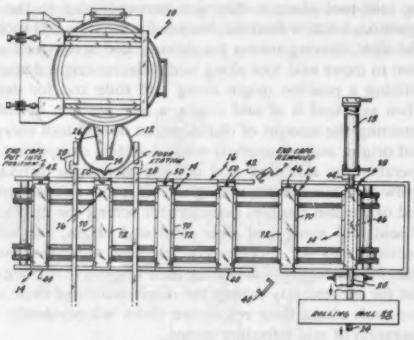
means responsive to said bulb-forming characteristic and at least one known characteristic of the blind fastener for determining the final desired tightened condition.

4,163,312

METHOD AND MEANS FOR PRODUCING ROLLED METAL PRODUCTS

Robert B. Green, 2106 Walnut La., Vista, Calif. 92083

Filed May 15, 1978, Ser. No. 905,739
Int. Cl.[2] B22D *11/126*
U.S. Cl. 29—527.7 **12 Claims**



1. The process of producing rolled metal products without reheating ingots, comprising:

(a) melting metal and providing a quantity of molten metal at a first pouring station,

(b) providing a series of separate molds and conveying said molds on an endless path and bringing said molds serially past said first station and serially, individually pouring said molds at said first station,

(c) moving said molds serially from said first station through a cooling area to a second ingot-extraction station and during operation of the process providing a series of molds at all times in said cooling area,

(d) applying heat to the exterior side surfaces of the metal in said molds during at least the major portion of the movement of said molds from said first to said second station and applying sufficient heat to prevent reduction of temperature of said exterior side surfaces of the metal in said molds below a selected minimum temperature which is a temperature suitable for rolling, and

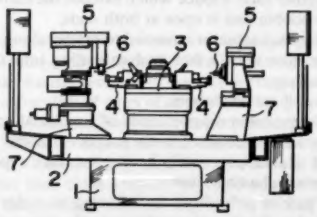
(e) extracting the metal in said molds as ingots at said second station and immediately rolling said ingots producing said products.

4,163,313

TRANSFER MACHINE

Takeshi Matsuno; Fumiya Nishiyama, and Takeshi Kobayashi, all of Narashino, Japan, assignors to Seiko Seiki Kabushiki Kaisha, Japan

Filed Oct. 12, 1977, Ser. No. 841,400
Claims priority, application Japan, Oct. 12, 1976, 51-122041
Int. Cl.[2] B23Q *7/00;* B23B *3/00;* B23C *1/16;* B23G *1/20*
U.S. Cl. 29—563 **3 Claims**



1. A transfer machine, comprising: a movable indexing table having a plurality of workpiece positions where respective workpieces are positioned in use; a plurality of working units

each defining a working station positioned around said movable indexing table opposite a respective workpiece position; means for moving said indexing table to change the respective workpiece position which is opposite a particular working unit; wherein each of said working units comprises a tool, infeeding means for infeeding said tool toward a respective workpiece position for working on the workpiece and for withdrawing the tool from the workpiece, a slide for displacing said tool along a direction perpendicular to the infeed direction, a screw-feed mechanism for moving said tool along said slide, driving means for driving said screw-feed mechanism to move said tool along said slide, an origin detector for defining a position origin along said slide and for detecting when said tool is at said origin, a tool position detector for detecting the amount of displacement of said tool away from said origin; and a numerical control system comprising means operable for actuating said driving means for driving said screw-feed mechanism, setting circuit means cooperative with said origin and position detectors for setting the displacement of said tool along said slide from said origin, and selecting circuit means for successively selecting successive working units for successively actuating their respective driving means and for successively setting the displacement of their respective tools along their respective slides independently of the operation of said infeeding means.

4,163,314

METHOD OF MANUFACTURING AN ELECTROMAGNETIC RELAY

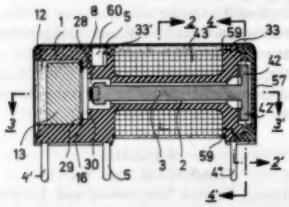
Hans Sauer, Fichtenstrasse 5, 8024 Deisenhofen, Fed. Rep. of Germany, assignor to Matsushita Electric Works, Ltd., Osaka, Japan and Hans Sauer, Deisenhofen, Fed. Rep. of Germany, part interest to each

Division of Ser. No. 639,406, Dec. 10, 1975, Pat. No. 4,075,585. This application Jun. 14, 1977, Ser. No. 806,501

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1974, 2459039

Int. Cl.[2] H01F *41/06*

U.S. Cl. 29—593 **7 Claims**



1. A method of manufacturing an electromagnetic relay comprising

(a) assembling

(i) a bobbin of plastic material defining therein a protective tube, a contact chamber and a magnet chamber that together form a space which extends the entire length of the bobbin and is open at both ends,

(ii) a contact actuator mounted to extend along the protective tube with a free end extending into the contact chamber,

(iii) a coil on the bobbin,

(iv) a permanent magnet made of a material actuatable as a getter and disposed in the magnet chamber to seal one end of said space while having a surface exposed to the contact chamber, and

(v) a pair of pole shoes each having an outer end in the magnet chamber in proximity to the permanent magnet and an inner end extending into the contact chamber to form a fixed contact for cooperation with said free end of the actuator,

(b) subjecting the space to a vacuum and an elevated temperature to drive off moisture and activate the getter,

(c) replacing the vacuum with an atmosphere of a protective gas,

(d) and sealing the other end of the space with a closure.

4,163,315

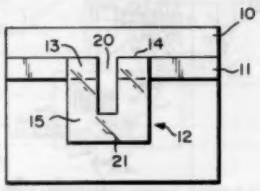
METHOD FOR FORMING UNIVERSAL FILM RESISTORS

Wayne E. Neese, Hoffman Estates, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed May 17, 1978, Ser. No. 906,548

Int. Cl.[2] H01C *7/00*

U.S. Cl. 29—620 **5 Claims**



1. The method of forming an electrical resistor comprising:

applying an uninterrupted conductor on a dielectric substrate;

depositing a resistive material, including a first end applied on said uninterrupted conductor and a second end terminating away from said conductor;

simultaneously removing at least one portion of both said conductor and said resistive material, starting at said resistive material first end, severing said conductor, and terminating in an area of said resistive material second end;

thereby, increasing the resistance of said resistor.

4,163,316

SAFETY RAZOR

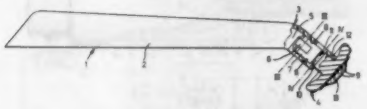
Peter Hagmann, Langendorf, and Ernst Müller, Bibern, both of Switzerland, assignors to Morris AG, Switzerland

Filed Jan. 17, 1978, Ser. No. 870,091

Claims priority, application Switzerland, Jan. 17, 1977, 546/77

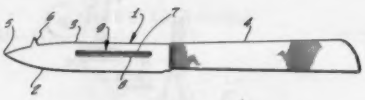
Int. Cl.[2] B26B *21/06*

U.S. Cl. 30—47 **1 Claim**



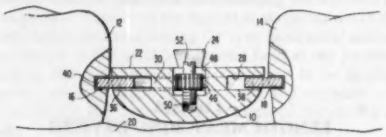
1. A safety razor comprising a cutting head having two oppositely disposed longitudinal surfaces and at least one cutting edge on each of said surfaces, a cutting head holder joining said cutting head, a handle, an angled extension piece joining said handle and including a recess formed at one end of said extension piece receiving said holder, cooperating means on said holder and within said recess for securing said holder against axial displacement relative to said extension piece, said holder having two parallel outer surfaces and said recess having complementary parallel surfaces which engage said outer surfaces of said holder to locate said holder circumferentially in said recess in one of two operating positions separated by 180°, and at least one of said holder and said extension piece being made of resilient material whereby said holder can be rotated in said recess between said operating positions.

4,163,317
KNIFE ASSEMBLY
August Levanti, 562 Luton Dr., Glendale, Calif. 91206
Filed Nov. 7, 1977, Ser. No. 849,003
Int. Cl.[2] A47J *17/04*
U.S. Cl. 30—123.7 **6 Claims**



1. A knife having a handle and a blade with sharpened and dull substantially smooth edges, said edges tapering to form a point, said dull edge having a point near the tip of said blade for scoring and piercing, said scoring and piercing point defined by opposing tapering straight edges protruding from said dull edge of said blade as a substantially equal angle to facilitate scoring and piercing without damaging the underlying portion of the object to be pierced and scored, said scoring and piercing point being limited by the dull side of the blade.

4,163,318
DEVICE FOR REPLACING MISSING TEETH IN HUMAN DENTITION
Pasquale Tigani, 5219 Ridgefield Rd., Washington, D.C. 20016
Filed Mar. 21, 1977, Ser. No. 779,852
Int. Cl.[2] A61C *13/30*
U.S. Cl. 32—5 **1 Claim**



1. An artificial denture device comprising a backing member having a flat surface adapted to be disposed between two spaced apart existing teeth, groove means disposed in said backing member and opening outwardly in opposite directions on opposite sides of said backing member, a pair of arms slidably mounted in said groove means in spaced parallel relation to each other and said flat surface, operating means comprised of a screw member threaded into said backing member for rotation about an axis perpendicular to said flat surface between said arms, engaging means on said arms and said operating means for moving said arms in opposite directions upon rotation of said operating means for engaging the outer ends of said arms in opposed grooves in spaced apart existing teeth and facing means secured to said flat surface of said backing member to cover said operating means.

4,163,319
DENTAL OCCLUDER
Gilbert Ouaknine, 6, rue Mazzini, 11100 Narbonne, France
Filed Jun. 10, 1977, Ser. No. 805,472
Claims priority, application France, Jun. 11, 1976, 76 18350
Int. Cl.[2] A61C *11/00*
U.S. Cl. 32—32 **10 Claims**

1. A dental occluder for placing a bottom maxillary impression and a top maxillary impression in occlusion comprising:

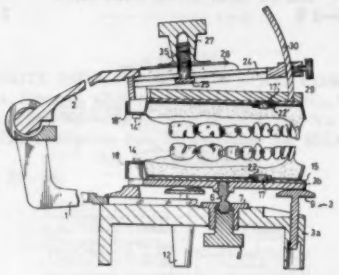
top and bottom arms articulated relative to each other,

a bottom base element secured to said bottom arm and including first magnetic means and first centering means,

a bottom matrix support including second magnetic means and second centering means, said first and second magnetic means cooperatively retaining said bottom matrix support on said bottom base element and said first and second centering means cooperatively positioning said bottom matrix support on said bottom base element.

a top base element including adjustable connection means for attaching said top base element to said top arm and further including third magnetic means and third centering means,

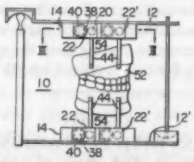
a top matrix support including fourth magnetic means and fourth centering means, said third and fourth magnetic means cooperatively retaining said top matrix support on said top base element and said third and fourth centering means cooperatively positioning said top matrix support on said top base element,



said adjustment connection means comprising a slide plate pivotally connected to an end of said top base element, for angular adjustment therebetween, said slide plate having an elongate slot therein and locking means passing through said slot for securing said slide plate to said top arm,

said slide plate further including at an end opposite said pivotal connection an opening through which passes a spline extending from said top base element, and means for releasably locking the position of said spline in said opening, whereby the angle between said top base element and said slide plate, and thus said top arm, may be adjusted.

4,163,320
DENTAL OCCLUDING INSTRUMENT
Seizo Yokota, 161, Daimyo 1-chome, Chuo-ku, City of Fukuoka, Fukuoka Prefecture, Japan
Filed Mar. 10, 1978, Ser. No. 885,216
Int. Cl.[2] A61C *11/00*
U.S. Cl. 32—32 **3 Claims**



1. A dental occluding instrument comprising a pair of supporting plates disposed in opposite parallel relationship, a pair of base blocks fixedly secured to said supporting plate to face each other, a plurality of pairs of opposite holding members in the form of rods disposed substantially perpendicularly to each of said base blocks to extend toward the other base block and be aligned with said holding members operatively associated with the other base block respectively, and control means for each pair of said holding members disposed in each of said base blocks to control a spacing formed between said opposite holding members, all said holding members holding a pair of models for the upper and lower jaws in such a manner that the model for the upper jaw is put in compressive contact with free

end portion of said holding members projecting beyond one of said base blocks and the model for the lower jaw is put in compressive contact with free end portions of said holding members projecting beyond the other base block.

4,163,321

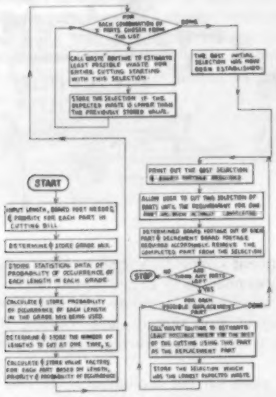
METHOD FOR SEQUENCING THE CUTTING OF ELONGATED STOCK

John P. Cunningham, Raleigh, N.C., assignor to Barr-Mullin, Inc., Raleigh, N.C.

Filed Oct. 21, 1977, Ser. No. 844,493

Int. Cl.[2] G06F *15/46*; G05B *13/00*

U.S. Cl. 33—1 S **2 Claims**



1. A method for the cutting of elongated stock from a grade mix of stock being processed such as boards of lumber having randomly located unusable lengths, containing knots, discoloration or the like, to minimize waste, said method comprising: establishing the required lengths and the board footage and quantities of pieces of each length to be cut, determining and storing the grade mix of stock, establishing the probability of having a given length of usable stock in each of the grades of stock being processed, determining a value factor for each desired length based on the desired length and the probability of the occurrence of the desired length, determining the number x of lengths to be cut at one time, and for each combination of x lengths determining the least possible waste for the entire cutting starting with this selection to determine the combination of parts to be cut at one time which results in the lowest waste for the entire cutting and cutting the elongated stock using the determined combination of parts which results in the lowest waste for the entire cutting until the requirement for the established quantity for one required length has been reached.

4,163,322

COMPASS WITH FINE ADJUSTMENT

Günther Partes, Brunn, Fed. Rep. of Germany, assignor to Intertech Zeichengeräte Günther Partes KG, Fed. Rep. of Germany

Filed Feb. 6, 1978, Ser. No. 875,409

Claims priority, application Fed. Rep. of Germany, Feb. 5, 1977, 2704864

Int. Cl.[2] B43L *9/22*

U.S. Cl. 33—27 B **4 Claims**

1. A compass comprising a pair of compass legs pivoted about an articulation axle and fine adjustment means comprising a pair of linear spreaders pivoted to the respective compass legs in spaced relation lengthwise of the legs, each spreader extending from its pivotal connection with the respective leg towards the other leg, a drive wheel between the spreaders and between the compass legs for moving the spreaders in mutually opposed directions on rotation of the drive wheel by contact of the drive wheel periphery with driving surfaces of the respective spreaders, the drive wheel having an axis perpendicular to the plane of the compass, support means for the drive wheel comprising front and rear half-shells defining a compass head, guide means for maintaining the spreaders in parallelism and in

driving contact with the drive wheel periphery during opening and closing of the compass and an operating disk coaxial with said drive wheel and in direct driving connection therewith for rotating said drive wheel to operate the spreaders, said operating disk being located on an outer surface of one of said half-shells.

4,163,323

LENGTH MEASURING DEVICES

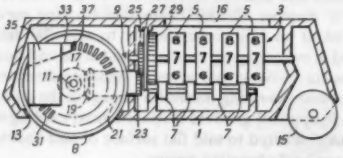
Hans Bud, 71 Northway, London NW11 6PD, England

Filed Apr. 20, 1977, Ser. No. 789,252

Claims priority, application United Kingdom, Apr. 22, 1976, 16445/76

Int. Cl.[2] G01B *3/12*

U.S. Cl. 33—141 R **11 Claims**



1. A length measuring device comprising a housing; a counter located in the housing with a plurality of coaxial number wheels for displaying the result of a measurement; and drive means for the counter including metering means rotatable by displacement in use of the device relatively to an article to be measured; wherein there is provided sound generating means having a part formed on the drive means and a further part secured to the housing, the two parts comprising a ring of teeth and a reed biassed into contact with the teeth so as repeatedly to experience during rotation of the metering means deflection by the teeth followed by impact therewith, the housing being internally shaped to provide a sound box for the sound generating means and the repeated impacts of the reed with the teeth serving in normal usage of the device to provide a substantially continuous audible indication of rotation of the metering means.

4,163,324
SURVEYING OF BOREHOLES

Michael K. Russell, Lynworth House, Prestbury, Cheltenham, and Anthony W. Russell, The Bittams, Crippetts Rd., Leckhampton, Cheltenham, both of England

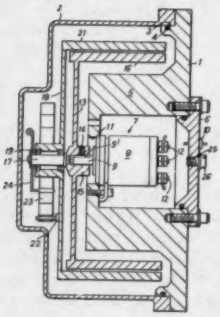
Filed Feb. 23, 1978, Ser. No. 880,873
Claims priority, application United Kingdom, Feb. 25, 1977, 8007/77
Int. Cl.[2] E21B *47/022*
U.S. Cl. 33—313 7 Claims

1. A method of determining the orientation of a surveying instrument in a borehole comprising the steps of determining the inclination angle of the instrument at the location thereof in the borehole, sensing, at said location, at least one vector component of the local magnetic field to determine the local magnetic field in the direction of a primary axis of the instrument aligned with the borehole, determining the azimuth angle of the instrument relative to the apparent magnetic north direction at said location, ascertaining the true horizontal and vertical components of the earth's magnetic field at the location of the borehole and determining the correction to be applied to the apparent azimuth angle from the true and apparent values for the horizontal and vertical components of the earth's magnetic field.

4,163,325
VERTICALITY SENSORS

David Hughes, Blackwater, England, assignor to Sperry Rand Limited, Bracknell, England

Filed May 19, 1978, Ser. No. 907,525
Claims priority, application United Kingdom, May 21, 1977, 21573/77
Int. Cl.[2] G01C *9/08*
U.S. Cl. 33—346 8 Claims

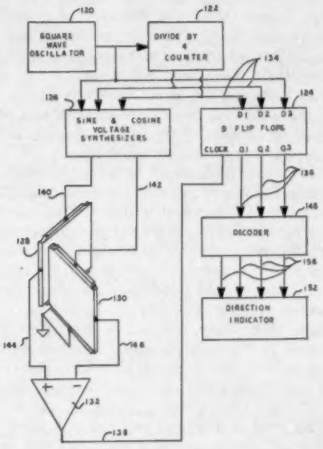


1. A verticality sensor comprising a casing within which is mounted a rotary pick-off device, said pick-off device having a body attached to the casing and having a rotatable shaft for relative rotational movement with respect to the casing and body, such movement producing an output signal from the pick-off representative of the angular rotation of the casing with respect to the vertical, pendulum means mounted on the pick-off shaft for relative rotational movement with respect thereto, and inertia means fixed to the pick-off shaft and coupled to the pendulum means through a fluid, with which the casing is filled, and through spring means, the arrangement being such that when the pendulum is subjected to lateral accelerations and undergoes rotational movement relative to the pick-off, the spring means is torsioned and thereby attempts to transmit that rotational movement to the inertia member which the latter resists, whereby the effect of lateral acceleration is reduced.

4,163,326
REMOTE INDICATING SOLID STATE COMPASS

Robert A. Edwards, 12 Notch Park Rd., Little Falls, N.J. 07424

Division of Ser. No. 452,430, Mar. 18, 1974, Pat. No. 4,030,204.
This application Jun. 10, 1977, Ser. No. 805,401
Int. Cl.[2] G01C *17/30*
U.S. Cl. 33—361 3 Claims



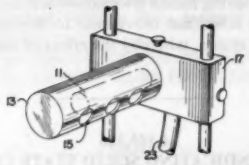
1. A remote indicating solid state compass which produces a discrete display of heading referenced to compass points for use in automobiles or the like including in combination, a digital counting means comprising counter and free running oscillator for continuously outputting digital code signals, sine and cosine voltage synthesizer circuit means for converting said digital code signals to sine and cosine voltage waveforms, magnetic heading sensing means including two Hall effect generators mounted in vertical planes at right angles to one another, one generator receiving said sine voltage across its current input terminals, the other generator receiving said cosine voltage across its current input terminals and with the two generators' Hall voltage output terminals connected in series for outputting a Hall effect generator difference voltage whose phase with respect to the applied sine voltage is proportional to heading, amplifier means for receiving said difference voltage and for producing therefrom an amplifier output signal which switches from one to the other of two levels when the polarity of said difference voltage reverses, logic D type latch circuit means receiving digital code data input from said digital counting means and clock input from said amplifier means for storing the digital code present when the clock input transitions positively, decoding means for converting codes stored in said D latches to code signals for controlling display means, display means comprising light emitting elements which indicate automobile heading relative to points of the compass.

4,163,327

DIRECT CONDENSER DEFROSTING SYSTEM

Taylor N. Thompson, and Douglas S. Fraser, both of New Paltz, N.Y., assignors to FTS Systems, Inc., Stone Ridge, N.Y.

Filed Nov. 4, 1977, Ser. No. 848,497
Int. Cl.[2] F26B 5/06
U.S. Cl. 34—5 **9 Claims**



1. In a freeze drying apparatus for dehydrating heat-sensitive materials contained in a plurality of receptacles, including refrigeration means to provide refrigerant fluid of a temperature lower than the temperature of the material to be freeze dried, manifold means having a plurality of ports formed therein to which said receptacles may be connected, and an elongated hollow condenser member disposed within the interior of said manifold means and receiving low temperature refrigerant fluid from said refrigeration means during a freeze drying cycle, the water vapor sublimated from said materials being condensed on the outer surfaces of said condenser member to form ice, the improvement comprising:

a plurality of randomly disposed heat transfer surfaces disposed within the interior of said condenser member;

an elongated conduit disposed within the interior of said condenser member adjacent an interior surface thereof;

heat sensing means removably insertable into said conduit and in thermal communication therewith for monitoring the temperature of said condenser member during said freeze drying cycle; and,

heating means alternately removably insertable into said conduit and in thermal communication therewith for defrosting said condenser means at the completion of said freeze drying cycle, said heating means being operable to provide thermal energy and vaporizing said refrigerant fluid within said condenser, said thermal energy being transferred by said refrigerant fluid to said randomly disposed heat transfer surfaces throughout the interior of said condenser member, whereby said refrigerant fluid and said randomly disposed heat transfer surfaces cooperate to quickly and uniformly increase the temperature of the surfaces of said condenser member to facilitate removal of the ice from the outer surfaces thereof while limiting the amount of thermal energy transferred to adjacent surfaces of the freeze dryer.

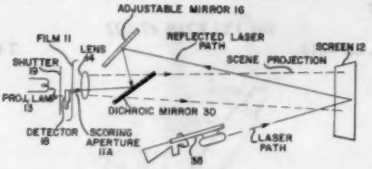
4,163,328

MOVING TARGET SCREEN WITH IMPROVED OPTICAL CONTROL

Frederick B. Sherburne; Herman I. Pardes, and Edward S. Hughes, all of Monmouth County, N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 10, 1978, Ser. No. 885,149
Int. Cl.[2] F41G 11/00
U.S. Cl. 35—25 **5 Claims**

1. An electro-optical weapon firing training apparatus comprising a film projector and viewing screen, at least one weapon on which is mounted a laser means to trigger an infrared energy laser beam aimed toward said screen upon firing said weapon; said projector including optical means for projecting the images of said film for providing a target scene on said screen at which said weapon may be aimed to direct a laser beam thereat, and said screen reflecting said laser beam, said optical means including an optical lens and a dichroic mirror positioned in the path of the projected images, said dichroic mirror being positioned at an angle with respect to the plane of said lens for allowing a major part of the visible light to pass therethrough onto said screen while reflecting the remainder of said visible light in a direction away from said lens, infrared



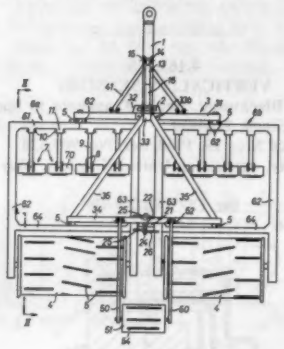
energy detection means, a first surface mirror moveably mounted in a position to receive the laser beam reflected from said screen and to reflect said laser beam onto said angled dichroic mirror, and said dichroic mirror further reflecting said laser beam energy through said lens to said detector means.

4,163,329

APPARATUS FOR RESURFACING A SNOW LAYER

Josef Neff, Toggenburgerstrasse 114, Wil, Schweiz, Switzerland

Filed Jan. 27, 1978, Ser. No. 873,017
Claims priority, application Switzerland, Jan. 28, 1977, 1087/77
Int. Cl.[2] E01H 4/00
U.S. Cl. 37—10 **6 Claims**



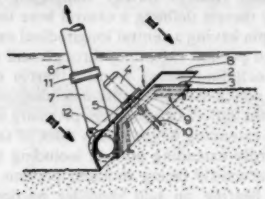
1. Apparatus for the resurfacing of a snow layer, said apparatus being of the type for connection to a tractor, having rollers for compacting the snow, and having a plurality of scrapers arranged side by side and having pivots for pivoting said scrapers vertically about an axis which is adjustable in height,

the improvement therein comprising that in the direction of movement of said apparatus said scrapers are arranged in front of said rollers, that the pivots of said scrapers are disposed immediately adjacent the front of a horizontally oriented main frame which is supported at its rear end on said rollers, and that a draw bar is attached to the front of said main frame by means of a pivotable horizontal shaft for connecting said machine to a tractor, said draw bar and said main frame also being connected to an adjustment member which is adjustable in length to alter the degree of slant of said draw bar to the plane of said main frame.

4,163,330
DREDGE CUTTER HEAD HAVING A VOLUTE COMPARTMENT

Nicolaas G. Konijn, Zuidspierdijkerweg, Berkhout, Netherlands

Filed Jun. 14, 1977, Ser. No. 806,504
Claims priority, application Netherlands, Jun. 23, 1976, 7606804
Int. Cl.[2] E02F 3/92
U.S. Cl. 37—64 29 Claims

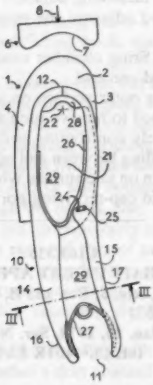


1. An apparatus for disintegrating and removing layers of earth, especially under water, comprising a housing in which at least one volute compartment is formed, which has an open lower edge, a rotor mounted in said compartment, and projecting downwardly outside the volute compartment, said rotor being rotatable about an axis which is substantially perpendicular to a plane through the lower edge of the compartment, drive means coupled to said rotor, said rotor comprising a brush in the shape of a cup provided with a central, downwardly opening cavity, a cutter element in said cavity and connected to the brush to follow the rotary motion of the brush, said cutter element protruding downwardly outside the brush, said volute compartment having a throat, discharge means connected to said compartment near said throat and means on said housing for suspension thereof from a moving device.

4,163,331
MACHINE FOR IRONING A SHOULDER AND A SLEEVE OF A GARMENT

Henry Renaut, Roubaix, France, assignor to Societe Anonyme dite: LEMAIRE, France

Filed Jun. 7, 1977, Ser. No. 804,380
Claims priority, application France, Jul. 26, 1976, 76 23291
Int. Cl.[2] D06F 71/40
U.S. Cl. 38—12 16 Claims

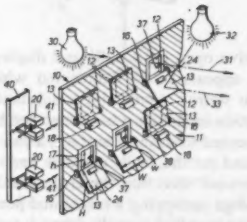


1. A machine for ironing upper garments at least in a zone comprising a shoulder, armhole and sleeve, said machine comprising a hollow former having an outer shape corresponding to the contour of at least one shoulder of the garment in wearing position, and a stretcher for stretching the sleeve of the garment, said stretcher comprising first and second elongate members arranged to extend longitudinally inside a sleeve of a garment placed on said former, from said former to and beyond the lower end of the sleeve, means hingedly connecting said first member to said former for movement about a horizontal axis lying approximately in the median plane of said former, means interconnecting said first and second members for movement toward and away from one another and for angular movement relative to one another and tensioning means for resiliently urging said elongate member apart, said sleeve stretcher being arranged to engage longitudinally within the sleeve of a garment placed on said former and to match the interior shape of the sleeve by tensioning the sleeve transversely by the action of said tensioning means.

4,163,332
MATRIX DISPLAY DEVICE

Hassan P. A. Salam, 80 Vicarage Ct., London, W.8, England

Continuation-in-part of Ser. No. 729,729, Oct. 5, 1976, abandoned. This application Jan. 30, 1978, Ser. No. 873,600
Int. Cl.[2] G09F 9/30, 13/04
U.S. Cl. 40—449 15 Claims



1. An electrically controlled information display device including a two-dimensional planar array of display elements arranged in horizontal and vertical rows, characterized in that:

each said display element is selectively settable to a first state in which there are simultaneously displayed to the observer two adjacent areas of which one is a light-emissive area arranged to emit light towards the observer and the other in a reflective area arranged to reflect light to the observer and to a second state in which each said area is replaced by a corresponding area of low reflectance;

the light-emissive area of each said display element is a light-transmissive area in an otherwise opaque member disposed between a light source and the observer;

each said display element includes a vane having a reflective face constituting said reflective area and an opposing face of lower reflectance constituting a said area of low reflectance;

each said vane is arranged for pivotal movement about a hinge axis adjacent to and to one edge of the respective said light-transmissive area between a first position in which said vane covers said light-transmissive area and exposes its lower-reflectance surface to the observer and a second position in which said vane uncovers said light-transmissive area and exposes its reflective face to the observer;

said vane comprises a permanent magnet arranged for cooperation with a respective one of an electromagnet assembly arranged for movement with respect to said array so that each said electromagnet is successively disposed for cooperation with each of a predetermined plurality of said permanent magnets to produce selective movement of the respective said vane between one and the other of said first and second positions;

stabilizing means are provided whereby each said vane is stable in each of said first and second positions;

said light source is common to a plurality of said display elements.

4,163,333

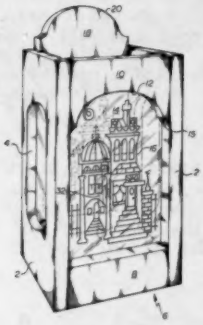
CANDLE BOX

Joseph Kwiatkowski, Rte. 1, Box 1040, Rainier, Wash. 98576

Continuation of Ser. No. 760,649, Jan. 19, 1977, abandoned. This application Jun. 12, 1978, Ser. No. 914,894

Int. Cl.[2] F21V *35/00*

U.S. Cl. 40—561 **1 Claim**



1. A decorative open top candle and display box which is attractive and appears to be illuminated whether or not it contains a light source, comprising a substantial rectangular main body portion including a back member having a reflective element secured to its inner surface, a pair of parallel side members secured to the back member and extending outwardly in a forward direction therefrom, said side members including openings occupying a substantial portion of the side surface to admit air to fuel a candle when a candle is used as a light source and further to admit sufficient light to reflect on the reflective surface and when combined with the light from the top illuminate the box when an internal light source is not used, a bottom to support an optional source of light and a front completing the box, the front including a transparent panel occupying a substantial portion of the front surface having decoration thereof which will be both illuminated and reflected by the reflective element.

4,163,334

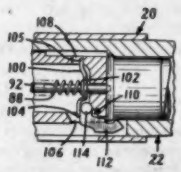
FIREARM SHELL EXTRACTOR

James Tollinger, Ithaca, N.Y., assignor to Ithaca Gun Company Incorporated, Ithaca, N.Y.

Continuation of Ser. No. 753,191, Dec. 22, 1976, abandoned, which is a division of Ser. No. 525,072, Nov. 19, 1974, Pat. No. 4,014,247. This application Dec. 28, 1977, Ser. No. 865,198

Int. Cl.[2] F41C *15/08*

U.S. Cl. 42—25 **1 Claim**



1. A firearm, comprising:
- a barrel having a breech end;
- a bolt movable between the open position in which said breech is open, and a closed position in which said bolt closes said breech;
- a firing pin slidably mounted in said bolt for movement towards and away from said breech;
- an extractor retainer in said bolt adjacent the end thereof nearest said breech;
- a firing pin spring urging said firing pin away from said breech and bearing on and urging said extractor retainer towards said breech;
- an extractor in said bolt and having a portion extending forwardly therefrom to engage the rim of a shell;
- said extractor retainer bearing on said extractor and holding said extractor in place in said bolt;
- said extractor retainer further comprising means formed centrally therein defining a central bore therethrough;
- said firing pin having a central longitudinal axis and includes a forward portion extending through said central bore;
- said bolt including means formed therein defining a slot through which said forwardly extending portion extends;
- said extractor including a trunnion pivotally mounted in said bolt and extending beyond both sides of said slot; and
- said forwardly extending portion including a hook portion and a rearwardly facing shoulder portion, said extractor retainer bearing on said shoulder portion to bias said extractor hook portion for rotation inward toward said firing pin axis.

4,163,335

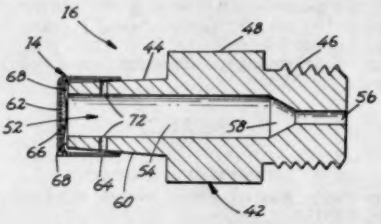
BLACK POWDER FIRING NIPPLE

Robert K. Ives, Portland, Oreg., assignor to Michaels of Oregon Co., Portland, Oreg.

Filed Jul. 14, 1978, Ser. No. 924,611

Int. Cl.[2] F41C *27/00*

U.S. Cl. 42—83 **2 Claims**



1. A nipple usable to ignite a propellent charge in a firearm of the type which employs a percussive firing cap having a skirt, said nipple comprising
- an elongate body including, adjacent one end, a cap-receiving portion, and adjacent the opposite end, a mounting portion,
- means defining a firing chamber extending axially into said nipple from said one end,
- means defining an outer surface on said cap-receiving portion, dimensioned to receive such a cap thereon, with the cap's skirt closely confronting said surface, and
- port means extending between and opening to said chamber and to a location on said surface which is covered by a cap received on said cap-receiving portion.

4,163,336

LIVE BAIT INSERT APPARATUS

Roger C. Carpenter, Rte. 3, Box 133 B, Fish Lake Rd., Pelican Rapids, Minn. 56572

Filed Jan. 13, 1978, Ser. No. 869,103

Int. Cl.[2] A01K *83/02*

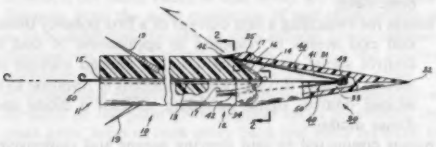
U.S. Cl. 43—37 **5 Claims**

3. Apparatus for use in fishing, comprising
- a body portion having
- a passage leading from an inlet at its forward end to an outlet at its aft end, and
- a camming surface at its forward end outward of and adjacent to said inlet,
- a plurality of substantially straight hooks, each having a

shank with a barb at one end and means to attach a leader at the other end,

leader means to join said hooks together forward of said inlet of said passage and to extend through said passage and outward from its said outlet,

means to position said hooks in a retracted position with their said means to attach a leader extending forward of their said barb ends, and with their shanks spaced angularly from each other about said forward end of said body portion and extending slantingly aft and outward, and



means, forward of said barbs of said hooks and outward of said camming surface, to restrict the forward angular movement of said hooks, said means including

a hollow substantially conical nose portion having a pointed tip and a rear edge by which the nose part is secured to the forward end of said body portion,

whereby, when said leader means is drawn aft relative to said body portion, the shanks of said hooks bear against its said camming surface and are driven from such retracted position outward and rotate angularly forward to a barb-extended position with the shanks bearing against said means to restrict forward angular movement.

4,163,337

FISHING LURE

James H. Kress, 580 Harwood Ave., Satellite Beach, Fla. 32937

Filed Oct. 25, 1977, Ser. No. 845,357

Int. Cl.[2] A01K *85/00*

U.S. Cl. 43—42.05 **11 Claims**

1. A fishing lure of the type coupled to a fishing line and the shank section of a barbed fishing hook, said fishing lure comprising in combination:

an elongated housing having a front end and a rear end, said housing defining therein an elongated housing void which defines a housing aperture adjacent said rear end thereof, said housing further defining a housing bore communicating through said housing from said housing void to open adjacent said front end of said housing for movably receiving therethrough the fishing line;

a plug having a front end for removably coupling within said housing void and a rear end thereof projecting from said housing aperture, said plug having a plug bore therein communicating between said front end and said rear end thereof for movably receiving the fishing line therethrough;

a relatively rigid sleeve for coupling with said second end of said plug so as to define a skirt channel therebetween; and

a plurality of elongated skirt elements each having a first end, a second end and a mid-section therebetween, with said mid-sections communicating through said skirt channel so as to allow said first and second ends of said skirt elements to flow substantially parallel to each other for obscuring the barbed fishing hook as said fishing lure is pulled through the water.

4,163,338

ARTIFICIAL FISHING LURE

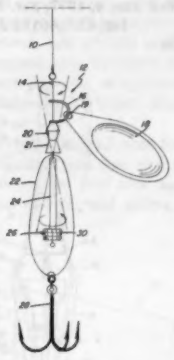
Francois Lucarini, Contes, France, assignor to Vibrax/MCA, Inc., Watertown, Mass.

Continuation of Ser. No. 727,895, Sep. 29, 1976, abandoned. This application Apr. 28, 1978, Ser. No. 900,873

Claims priority, application France, Dec. 18, 1975, 75 11141

Int. Cl.[2] A01K *85/01*

U.S. Cl. 43—42.17 **27 Claims**



1. An artificial fishing lure comprising, an elongated spindle, a vane rotatably mounted thereon, a housing axially mounted on said spindle aft of said vane, the spindle passing with clearance into said housing, a weight mounted with clearance around said spindle within said housing such that relative motion of said lure through the water imparts rotational movement to the vane which causes relative rotation of said weight with respect to said housing such that said weight moves into contact, including rotational contact, with the inside walls of said housing.

4,163,339

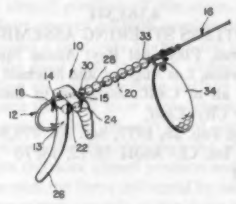
FISHING LURE

R. B. Worden, Box 384, Granger, Wash. 98932

Filed Feb. 9, 1978, Ser. No. 876,474

Int. Cl.[2] A01K *83/06*

U.S. Cl. 43—44.4 **4 Claims**



1. A fishing lure comprising:

a flexible nylon fishing line,

a hook having a shank, a barb at one end of said shank and an eye at the other end of the shank,

means coupling the free end of the line to the shank, the opposite end of said line passing through said eye, the line having a loop portion between said coupling means and said eye movable toward the shank for adjusting the size of the loop portion, and

means on said opposite end of the line external of the eye for restricting movement of the line through the eye toward the barb whereby the line can be pulled through the eye to reduce the loop portion on bait adapted to be caught between the shank and loop portion said means for restricting movement of line through the eye including at

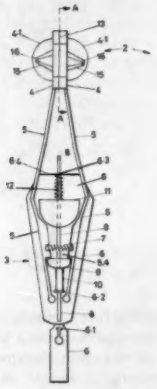
least one bead abutting the eye and having an opening threaded over the line and a separate friction member within said bead opening engaging the line and the opening for allowing only restricted movement of the line.

4,163,340

INSECT CAPTURING AND EXTERMINATING DEVICE

Schalk W. van der Merwe, P.O. Box 454, Pretoria, South Africa (0001)

Filed Jan. 4, 1977, Ser. No. 756,703
Int. Cl.[2] A01M *3/00*
U.S. Cl. 43—134 12 Claims



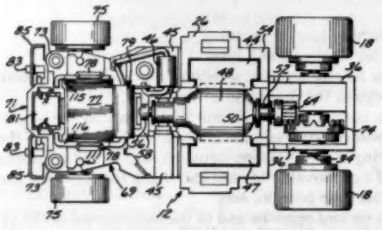
1. An insect capturing and exterminating device comprising
a capturing unit comprising a pair of jaw members relatively movable with respect to each other, each jaw member comprising a peripheral mating portion and a central recessed portion,
an actuating mechanism for actuating said jaw members to effect movement thereof with respect to each other,
an insect exterminating agent in said capturing unit,
an isolation unit, and
an opening in at least one of said jaw members central recessed portion leading from said capturing unit to said isolation unit.

4,163,341

SLOTLESS STEERING ASSEMBLY

Lawrence T. Jones, Playa del Rey; Anson Sims, Northridge; Ashley G. Howden, Los Angeles, and Michael J. Geery, Manhattan Beach, all of Calif., assignors to California R & D Center, Culver City, Calif.

Filed Feb. 25, 1977, Ser. No. 771,937
Int. Cl.[2] A63H *18/12, 18/10*
U.S. Cl. 46—262 1 Claim



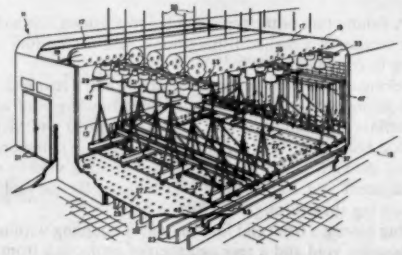
1. Miniature vehicle toy apparatus comprising:
a first means for providing a first energizing path adapted to be supplied with a vehicle driving signal and first and second selectively applicable turning control signals, said first means comprising a first lane of travel for said miniature vehicle;
second means for providing a second energizing path adapted to be supplied with said vehicle driving signal and said first and second turning control signals, said second means comprising a second lane of travel for said miniature vehicle;
a miniature vehicle adapted to be driven by said driving signal and having a pivotable steering means;
a coil means in said miniature vehicle for generating a magnetic field;
means for switching a first current of a first polarity through said coil means in response to application of said first control signal and for switching a second current of a second polarity through said coil means in response to said second control signal including at least a diode and a Zener diode;
means connected to said steering means and responsive to the magnetic field created by said first current for positioning said steering means in a first position to effect a change from said first lane to said second lane and responsive to the magnetic field created by said second current for positioning said steering means in a second position to effect a change from said second lane to said first lane;
means for biasing said wheels including a movable permanent magnet and a pair of pole pieces, a first pole piece providing a first steering position after an application of said first current and movement of the magnet toward the first pole piece and a second pole piece providing a second steering position after application of said second current and movement of the magnet toward the second pole piece, the permanent magnet remaining in contact with its respective pole piece to hold the wheels in the desired steering position.

4,163,342

CONTROLLED ENVIRONMENT AGRICULTURE FACILITY AND METHOD FOR ITS OPERATION

Lewis W. Fogg, Cazenovia; Kenneth R. Rauhala, Baldwinsville; H. Eugene Satterfield, North Syracuse, and Eion G. Scott, Fayetteville, all of N.Y., assignors to General Electric Company, Syracuse, N.Y.

Filed Mar. 24, 1978, Ser. No. 889,965
Int. Cl.[2] A01G *31/02*
U.S. Cl. 47—58 11 Claims



1. A controlled environment agriculture facility comprising:
(a) wall and floor means defining a plant growth enclosure within which a controlled atmosphere may be maintained;
(b) an array of plant grow support racks disposed within said enclosure, each said rack being of rectangular configuration with width and length dimensions and including means mounting the rack for at least limited reciprocal movement along a line parallel to its width dimension, the racks being arrayed in proximity to each other with their length dimensions in parallel relation;
(c) a plurality of lamps mounted in said enclosure above said

racks and divided into groups with the lamps of each group disposed along a line parallel to the length dimension of the racks and with the lamp groups spaced along a line parallel to the width dimension of the racks, the number of such lamp groups being correlated to the number of support racks as a fractional multiple thereof;

(d) said plant grow support rack array being movable back and forth between a first position in which alternating racks of said array are disposed in sufficiently direct proximity to a respective one of said lamp groups to be subjected thereby to relatively high intensity illumination and in which the other racks of said array are disposed more distantly from the most proximate of said lamp groups so as to be subjected thereby to substantially lower intensity illumination, and a second position in which the relative intensities of illumination of the racks of said array are reversed, thus enabling even distribution of illumination as between all the plant grow support racks by shifting the plant grow support rack array back and forth between its first and second positions.

4,163,343

EDUCATIONAL TOY AND AMUSEMENT DEVICE

Connie Schoenfield, P.O. Box 661, Beverly Hills, Calif. 90210

Filed Apr. 25, 1978, Ser. No. 899,722
Int. Cl.[2] A01C *1/04*
U.S. Cl. 47—66 **5 Claims**

1. A toy comprising an outer porous housing forming a pocket therein, fluid absorbing material disposed within said pocket, said fluid absorbing material being positioned to form a recess with respect to certain portions of the outer housing, seeds disposed in said recess, and plastic material encasing said fluid absorbing material in all areas except where said seeds are positioned.

4,163,344

OVEN HINGE MECHANISM INCLUDING CAM BALANCE MODIFIER

Richard M. Scherer, Oxford, Miss., assignor to Chambers Corporation, Osford, Miss.

Filed Dec. 8, 1977, Ser. No. 858,642
Int. Cl.[2] E05F *1/10*
U.S. Cl. 49—386 **4 Claims**

1. For use with an oven structure having side walls, a rear wall, an access opening disposed in a substantially vertical plane opposite the rear wall and a door for the access opening, the door being movable through a plurality of positions between a vertical closed position where the door closes the access opening and a substantially horizontal open position to provide access to the interior of the oven structure, a hinge mechanism comprising:

bracket means rigidly mounted to the side wall of the oven structure having a camming surface on a horizontal top edge thereof and further including an integrally connected arm member;

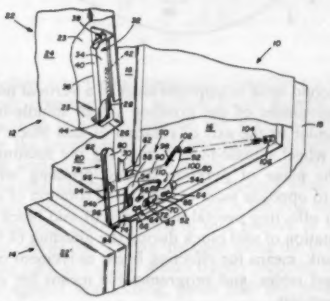
said camming surface of said bracket means including a relatively long convex arcuate portion, a relatively short concave arcuate portion adjacent one end of said relatively long convex arcuate portion and a relatively short convex arcuate portion adjacent one end of said relatively short concave arcuate portion;

a hinge bracket having first and second ends, said second end thereof being pivotally secured to said arm member of said bracket means;

a channel frame secured within the door adapted to receive said hinge bracket for rendering the door pivotally cooperative with said hinge bracket for movement between the door closed position and the door open position;

a lever having first and second ends, said first end being pivotally secured to said hinge bracket between said first and second ends thereof, said second end of said lever including first and second arm members integrally connected to said lever and disposed on opposite sides of said lever to form a substantially T-shaped structure on said second end of said lever;

spring means having first and second ends for biasing said lever of the oven structure, said first end of said spring means being attached to said first arm member of said lever and said second end of said spring means being



attached to the side wall of the oven structure to a point remote from said bracket means, said spring means lying in a plane substantially perpendicular to the rear wall of the oven structure;

said second arm member of said lever including an anti-friction roller mounted for rotation about a fixed axis secured to said second arm member for frictionally engaging said camming surface of said bracket means, said anti-friction roller engaging said relatively short convex arcuate portion in the closed position of the door, such that said relatively short convex arcuate portion of said camming surface provides a relatively slight initial resistance to the opening of the door from the door closed position; and

said lever acting on said camming surface is operative to counterbalance the door over a predetermined range, the counterbalancing effect of said lever increasing in the course of moving the door through the plurality of positions between the door closed position and the door open position to match the force delivered by said spring means as said spring means extends as the door moves from the door closed position to the door open position.

4,163,345

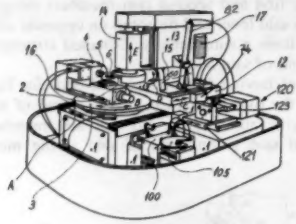
ARRANGEMENT FOR THE GRINDING OF ROTARY PROFILE CUTTERS

Max Meili, Viganello, Switzerland, assignor to AG fur Automatisierung, Switzerland

Filed Jun. 16, 1977, Ser. No. 807,336
Claims priority, application Switzerland, Jun. 17, 1976, 7731/76; Jun. 1, 1977, 6693/77
Int. Cl.[2] B24B *3/02*
U.S. Cl. 51—33 W **4 Claims**

1. Apparatus for grinding rotary profile cutters comprising, in combination, a base, a first table mounted on said base for movement linearly thereon, a platen mounted free to rotate on

said first table, a rotatable workpiece carrier assembly fixed on said platen, the axis of said workpiece carrier intersecting and being perpendicular to the axis of rotation of said platen, a collet on said workpiece carrier for a milling cutter blank, a programmable indexer on said workpiece carrier for angular positioning of said blank in different successive angular positions, a second table movable linearly perpendicularly to the movement of the first table, a block on said second table, a grinding wheel spindle-head slidable on said block, means mounting said block pivotally on said second table for tilting movement about an axis of rotation parallel to the movements



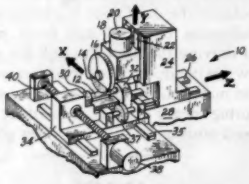
of said second table to opposite sides of a vertical position, the sliding movement of the grinding wheel spindle-head being perpendicular to the axis of rotation of said block when said grinding wheel spindle-head is carrying the rotating grinding wheel, the plane of gyration of said grinding wheel being movable to opposite sides of the axis of rotation of said block, means for effecting pivotal movement of said block about the axis of rotation of said block during the grinding of the milling cutter blank, means for effecting linear movement of said first and second tables, and programmable means for controlling said movements.

4,163,346

GRINDING MACHINE CONTROL

Charles B. Matson, Cincinnati, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Feb. 1, 1978, Ser. No. 874,312
Int. Cl.[2] B24B *49/16, 53/14*
U.S. Cl. 51—165.77 **9 Claims**



1. In a tangential grinding machine having a base, a grinding wheel, and means for effectuating a relative tangential infeed movement between a workpiece and the grinding wheel along a grinding path of varying length, an apparatus for controlling the tangential infeed rate, comprising:

(a) means for detecting variations in the contact portion of the tangential grinding path length; and

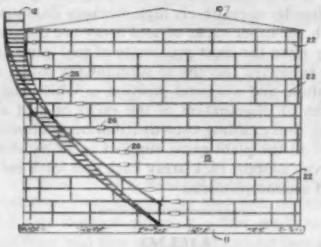
(b) means for controlling the rate of relative tangential movement between the grinding wheel and the workpiece in accordance to the detected variations in the grinding path length.

4,163,347

METHOD AND APPARATUS FOR SECURING INSULATION PANELS TO A STRUCTURE TO BE INSULATED THEREBY

Emil Marcmann, P.O. Box 5, Medford, N.J. 08055

Filed Nov. 8, 1977, Ser. No. 849,709
Int. Cl.[2] B65D *25/18;* E04B *1/74*
U.S. Cl. 52—105 **8 Claims**



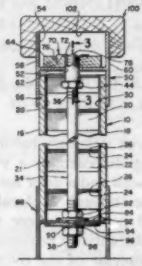
4. A combined fastener and tension indicator means for maintaining an undulated band in constant contact with the exterior surface of insulation panels which have been applied to the exterior surface of the structure to be insulated thereby and wherein said structure is subjected to expansion and contraction depending upon the atmospheric conditions, the improvement comprising said band provided with a plurality of undulations formed therein to thus present high portions and valleys therebetween, the ends of said band being secured to a fastener and tension indicator, means on said fastener and tension indicator to vary the amount of tension applied to said band the tension applied to said band causing said valleys to remain in constant contact with the exterior surface of the said panels and to exert a force thereon to thus maintain said insulation panels in close contact with the exterior surface of the structure to which the panels have been applied notwithstanding the expansion and contraction of the said structure.

4,163,348

PARTITION HAVING STABILIZING BAR AND METHOD

Donald K. Thomas, Jr., 1710 Laurel St., South Pasadena, Calif. 91030

Filed Aug. 28, 1978, Ser. No. 937,226
Int. Cl.[2] E04C *2/56*
U.S. Cl. 52—241 **7 Claims**



1. A partition comprising:

two spaced panels forming outer wall surfaces,

means spacing said panels,

elongated H-shaped members fitted on each of two opposite respective ends of said panels,

each H-shaped member forming an inwardly and an outwardly facing channel,

said inwardly facing channels each having a bottom adjacent edges of said panel ends and having inner faces of its side walls adjacent marginal portions of said wall surfaces,

a partition stabilizing bar extending between said panels, adjacent said means spacing, and through both channel bottoms at both ends of said panels,

said bar being threaded at both ends,

nut means fixed to a channel bottom and extending therethrough at one end of said panels,

one end of said bar being threadedly engaged with said nut means,

a nut on said bar adjacent said one end thereof positioned to limit the engagement of said bar with said nut means, and

nuts on said bar adjacent the other end thereof tightening said bar to said channel bottoms at the other end of said panels,

whereby said H-shaped members are secured to said panels and said bar prevents bowing or collapse of said partition in the direction of said bar.

4,163,349

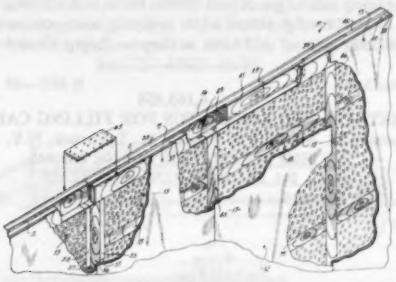
INSULATED BUILDING PANELS

Glenn W. Smith, P.O. Box 36, Russells Point, Ohio 43348

Filed May 26, 1977, Ser. No. 800,697

Int. Cl.[2] E04H *1/00*; E04C *1/00*

U.S. Cl. 52—241 **8 Claims**



1. A plurality of wall sections joined together on a deck means provided with a mounting plate, each of said wall sections comprising a plurality of insulated panels, each of which comprise an interior insulating core, an exterior skin and an interior skin, both of which have edge portions extending beyond said core, a header bearing post disposed between each panel, the interior and exterior skins of each panel respectively overlapping approximately one-half of said bearing post and being attached thereto, header means extending across the tops of said bearing posts, foot plate means extending beneath the bottoms of said bearing posts and edge portions of said interior and exterior skins covering said header means and said foot plate means, and further including means joining one wall section to another wherein each section includes at least one end panel, said joining means including a section splice bearing post disposed between said end panels, the skins of said end panels overlapping said section splice bearing post, header means bearing members connected to the sides of upper portions of said section splice bearing post, and a relieved portion in the insulating core of each end panel for receiving one of said header means bearing members.

4,163,350

CEILING ATTACHMENT APPARATUS

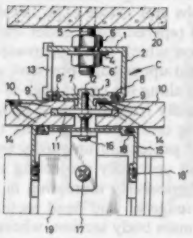
Nobushige Doguchi, Toyama, and Moriyoshi Hayashi, Kurobe, both of Japan, assignors to Yoshida Kogyo K.K., Tokyo, Japan

Filed Dec. 6, 1977, Ser. No. 858,013

Claims priority, application Japan, Dec. 7, 1976, 51-163618 [U]; Dec. 7, 1976, 51-163620[U]

Int. Cl.[2] E04B *1/62, 5/52*

U.S. Cl. 52—403 **6 Claims**



1. A ceiling attachment apparatus comprising a horizontal ceiling joist consisting of a molded frame member having a screw-inserting groove formed on the lower side thereof extending in the longitudinal direction, means adjustably rigidly fixing said joist to the ceiling, a screw to be inserted into said screw-inserting groove, at least one ceiling panel having a horizontally extending groove formed in the side edge thereof and an attaching plate inserted in said groove of the ceiling panel, said ceiling panel being disposed along the lower face of said ceiling joist, and screw means tightly securing said attaching plate against said ceiling panel and the panel thereby against the joist and in fixed relation to the ceiling.

4,163,351

ARCHITECTURAL PANEL MATERIAL FOR USE AS ROOFING MATERIAL, MATERIAL FOR EXTERNAL WALL AND THE LIKE PURPOSES

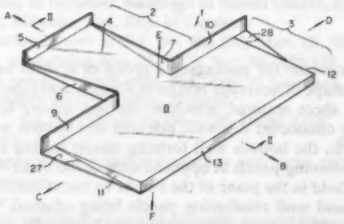
Takashi Ishikawa, No. 1355,, Ooaza Higashine Ko, Higashine-shi, Yamagata-ken, Japan

Filed Nov. 25, 1977, Ser. No. 854,952

Claims priority, application Japan, Nov. 30, 1976, 51-161061[U]

Int. Cl.[2] E04D *1/18*

U.S. Cl. 52—542 **8 Claims**



1. An architectural panel useful as a roofing material or an external wall material, comprising: a thin plate having the shape of an inverted T in plan view in which the lower crossbar portion of the T defines a main body section having an inclined area and the upper stem portion of the T defines a head section which is adapted to be overlapped by the main body sections of other like plates, said head section having an upper edge and side edges extending downwardly from the ends of said upper edge, said main body section having a lower

edge, side edges extending upwardly from the ends of said lower edge and upper edge portions extending from the upper ends of said side edges of said main body section to the lower ends of the side edges of said head section, upwardly projecting tabs extending along the upper edge portions of said main body section and projecting upwardly from the plane of said main body section, downwardly projecting tabs extending along the side edges and the lower edge of said main body section and projecting downwardly from the plane of said main body section, said downwardly projecting side edge tabs of said main body section progressively increasing in height in a direction from said upper edge portions of said main body section to said lower edge thereof, said downwardly projecting side edge tabs and lower edge tab defining the side and lower edges of a tapered space under the inclined area of said main body section which space decreases in height from said lower edge to said upper edge portions; an upwardly projecting tab extending along the upper edge of said head section and projecting upwardly from the plane of said head section, upwardly projecting tabs extending along the side edges of said head section and projecting upwardly from the plane of said head section, said upwardly projecting side edge tabs of said head section progressively increasing in height in a direction from said upper edge of said head section to the upper edge portions of said main body section, wherein the height (H_3) of said downwardly projecting tab along the lower edge of said main body section (1) is substantially equal to the height (H_2) of said upwardly projecting tabs along the upper edge portions of said main body portion, and (2) is substantially equal to or greater than the height (H_1) of the upwardly projecting tab along the upper edge of said head section, and wherein the length of said head section is greater than the length of said main body section.

4,163,352

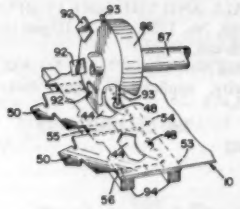
BOTTLE PACKAGING MACHINE

Robert H. Ganz, Saddle River, N.J., assignor to Federal Paper Board Company, Inc., Montvale, N.J.

Division of Ser. No. 805,855, Jun. 13, 1977, Pat. No. 4,100,715. This application Apr. 7, 1978, Ser. No. 894,502

Int. Cl.[2] B65B *61/00*

U.S. Cl. 53—393 **5 Claims**



1. A machine for packaging a group of articles having the general shape of beverage bottles in wraparound type blanks of foldable sheet material which is cut and scored to provide hingedly connected top wall, sidewall and bottom wall forming panels, the bottom wall forming panels having associated wall reinforcing panels at opposite ends of the blank which are initially held in the plane of the blanks by uncut portions of the blanks, said wall reinforcing panels being adapted, when released, to hinge on a score line spaced inwardly of the end edges of the blank so as to be folded into flat engagement with adjoining portions of the blank and to be secured by engaging end marginal portions beneath bendable tab members cut in the sidewall panels, said machine comprising a blank carrying conveyor having a generally horizontal run with means thereon for supporting successive blanks which are positioned thereon with said reinforcing panels disposed so as to travel along opposite sides of the blank supporting conveyor, and means disposed along opposite sides of said conveyor run engaging the blanks at points on opposite faces thereof for breaking said uncut portions of successive blanks so as to release the end panels, means disposed along said conveyor run for hinging said reinforcing panels into engagement with adjoining face portions of the blanks and means disposed along said conveyor run for engaging said tab members and said reinforcing panels so as to force said tab members into overlying relation with marginal portions of said reinforcing panels thereby to secure said reinforcing panels in engagement with said adjoining portions of the blanks.

4,163,353

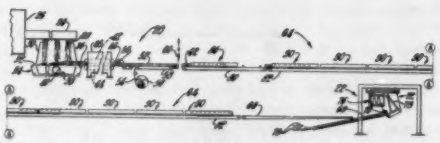
METHOD OF PACKAGING COMPRESSIBLE FIBROUS BATTS

Lawrence R. Finn, Toledo; Daniel A. McCartan, Heath, both of Ohio, and Gary M. Schmandt, Bellevue, Wash., assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Division of Ser. No. 755,370, Dec. 29, 1976, Pat. No. 4,085,560, which is a continuation of Ser. No. 585,161, Jun. 9, 1975, abandoned. This application Feb. 13, 1978, Ser. No. 877,140

Int. Cl.[2] B65B *63/02, 63/04*

U.S. Cl. 53—430 **8 Claims**



1. A method of making a package of compressible fibrous batts comprising forming a compressible elongate layer of randomly-disposed fibers held together by a binder, severing said layer into fibrous batts of determinate length, retaining and collecting said batts in spaced, end-to-end relationship by engaging side edges of said fibrous batts, and winding the batts in a spiral configuration while applying compressive forces to the outer ones of said batts as they are being wound.

4,163,354

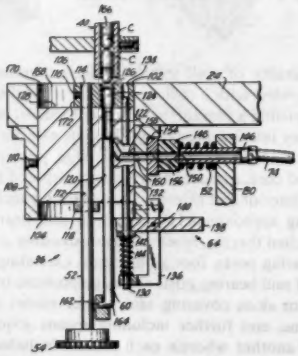
METHOD AND APPARATUS FOR FILLING CAPSULES

Leonard H. Austin, 8 S. William St., Lynbrook, N.Y. 11563

Filed Mar. 22, 1978, Ser. No. 888,845

Int. Cl.[2] B65B *1/24, 1/06, 43/40*

U.S. Cl. 53—436 **44 Claims**



38. A method for filling capsules having a body section telescoped within a cap section, said method comprising the steps of:

(a) receiving the capsule sections in a two part capsule filling station formed in a table that is rotatable about a first axis, one of the parts of the capsule filling station being rigidly

secured to the table for rotation together therewith about the first axis, the second part of the capsule filling station being coupled to the first part for rotation relative thereto about a second axis that is parallel to and spaced from the first axis, a portion of the first and the second parts of the capsule filling station in combination with a portion of the table defining a recess for receiving the material with which the capsule is to be filled, the second part of the capsule filling station being rotatable within the recess;

(b) depositing a supply of the material with which the capsule is to be filled into the recess;

(c) axially separating the two capsule sections from each other whereby the capsule body section is contained entirely within the first part of the capsule filling station and whereby the capsule cap section is contained entirely within the second part of the capsule filling station;

(d) rotating the second part of the capsule filling station with respect to the first part of the capsule filling station about the second axis whereby the material deposited in the recess is swept by the second part of the capsule filling station into the capsule body section;

(e) axially displacing the capsule body section relative to the capsule cap section whereby the two capsule sections are telescoped one into the other; and

(f) ejecting the filled capsule from the capsule filling station.

4,163,355

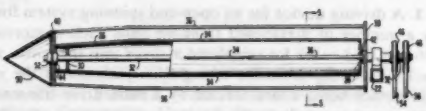
CROP HARVESTING APPARATUS

John W. Edwards, Wauchula, Fla., assignor to Ginny Bee Harvester Corporation, Tampa, Fla.

Continuation of Ser. No. 570,718, Apr. 23, 1975, abandoned, which is a continuation-in-part of Ser. No. 508,903, Sep. 24, 1974, abandoned, which is a continuation-in-part of Ser. No. 410,262, Oct. 26, 1973, Pat. No. 3,992,861, which is a continuation-in-part of Ser. No. 386,421, Aug. 7, 1973, abandoned, which is a continuation-in-part of Ser. No. 362,453, May 21, 1973, abandoned, which is a continuation-in-part of Ser. No. 350,168, Apr. 11, 1973, abandoned, which is a continuation-in-part of Ser. No. 339,914, Mar. 9, 1973, abandoned. This application Nov. 16, 1976, Ser. No. 742,086

Int. Cl.[2] A01D *46/20*

U.S. Cl. 56—328 R **33 Claims**



1. A crop harvesting apparatus comprising:

a support member defining a plane;

a plurality of crop-severing rods, each of said plurality having a longitudinal axis and a crop-contacting surface portion;

each of said plurality of crop-severing rods having mounting means having a longitudinal axis and rotatably mounting its crop-severing rod on said support member for rotation of its crop-severing rod about an axis parallel to the longitudinal axis of that crop-severing rod, with the longitudinal axis of said crop-severing rods being substantially perpendicular to the support member plane for insertion of the crop-severing rods among crop-bearing foliage for harvesting of crops therefrom;

drive means for rotating said mounting means to rotate said crop-severing rods for orbital rotation of said crop-contacting surface portions about their respective mounting means longitudinal axis;

a plurality of crop-catching rods around said crop-severing rods for catching crops that have been severed from crop-bearing foliage; and

means defining a crop-storage area for storing crops that have been severed from crop-bearing foliage and caught by said crop-catching rods, including hinge means permitting hinged movement of said defining means for emptying of the crop-storage area.

4,163,356

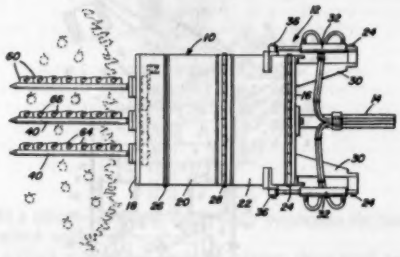
TREE FRUIT PICKER

Robert J. Robbins, and Desmond W. Robbins, both of 1036 Biltmore Dr., NW., Winter Haven, Fla. 33880

Filed Mar. 9, 1977, Ser. No. 775,945

Int. Cl.[2] A01D *46/24*

U.S. Cl. 56—328 R **6 Claims**



1. A fruit picking apparatus includng an elongated arm defining base and free ends, said arm including means defining elongated outwardly opening fruit stem receiving notches spaced therealong and opening outwardly of said arm in a direction inclined toward said base end of said arm, said notches including open opposite sides opening outwardly in opposite directions at right angles to said direction, the width of the open ends of said notches being sufficient to loosely receive fruit supporting stem portions and their leaves therethrough, a mount, a plurality of said arms supported in spaced parallel relation from said mount with the free ends of said arms projecting outwardly from one side of said mount and said base ends of said arms mounted from said mount for simultaneous oscillatory angular displacement relative thereto about axes extending longitudinally of said arms, said notches being confined to corresponding longitudinal sides of said arms, said arms comprising elongated rod members each including a longitudinally extending support groove formed therein, said notches being defined in plate-like members including base portions keyed in the corresponding groove.

4,163,357

APPARATUS FOR CABLE-TWISTING TWO YARNS

Aloys Greive, Münster, and Aloys Horstmann, Greven, both of Fed. Rep. of Germany, assignors to Hamel GmbH, Zwirnmaschinen, Münster, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 886,802, Mar. 15, 1978. This application Apr. 25, 1978, Ser. No. 899,735

Claims priority, application Fed. Rep. of Germany, Jun. 13, 1977, 2726603; Dec. 21, 1977, 2757138

Int. Cl.[2] D01H *13/04, 7/88;* D02G *3/38*

U.S. Cl. 57—58.36 **25 Claims**

1. An apparatus for twisting together two yarns, said apparatus comprising:

a frame;

a tubular spindle having and rotatable on said frame about an upright spindle axis, said spindle having a support for a supply of one of said yarns and being formed below said support with a radially open aperture;

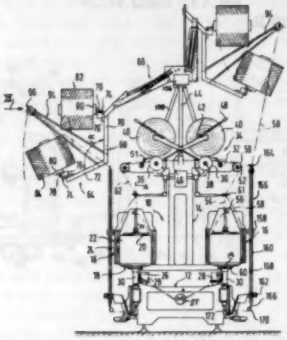
a rotatable takeup spool above said spindle on said frame said one yarn normally extending up from its supply and being engaged around said takeup spool;

a holder adapted to support a supply of the other of said yarns;

support means for displacement of said holder on said frame between an operating position generally above said takeup

spool and said spindle and a loading position below said operating position and next to said spool and spindle;

guide means on said frame including a substantially closed U-shaped guide tube having an upstream end opening upwardly and directed toward said holder and a downstream end opening upwardly toward said spindle for feeding said other yarn from its supply into the lower end of said spindle, thence out through said aperture, and thence up past said supply of said one yarn to said takeup spool;



spindle drive means connected to said spindle for rotating same about said spindle axis and thereby twisting said yarns about each other;

takeup drive means for rotating said takeup spool and thereby winding the twisted yarns upon said takeup spool; and

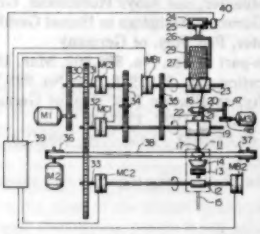
means for forming a stream of gas in said guide tube from said upstream end to said downstream end for pneumatically entraining and threading a filament therethrough.

4,163,358

APPARATUS FOR CONTROLLING THE DRIVING OF AN OPEN-END SPINNING MACHINE

Tatuo Takeuchi, Aichi; Kazuyoshi Ono, Chiryu; Naotake Furukawa, Aichi; Katsuaki Sugiura, Okazaki; Osamu Suzuki, Obu, and Takeshi Shimizu, Kariya, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Aichi, Japan

Filed Jan. 19, 1978, Ser. No. 870,751
Int. Cl.[2] D01H *1/12, 1/22*
U.S. Cl. 57—78 **10 Claims**



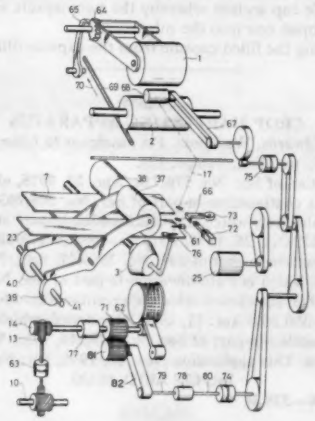
1. A driving control apparatus for an open-end spinning machine provided with a plurality of spinning units each comprising a spinning rotor, a feed roller for feeding a bundle of fibers to said spinning rotor, a winding roller for taking out a yarn from said spinning rotor and winding the yarn to form a yarn package, a holder for rotatably supporting said yarn package, and provided with a driving device for driving said feed roller and said winding roller, respectively, said driving device including clutch means; comprising means for detecting the quantity of the wound yarn on said yarn package and control means for setting operational timings of said feed roller and said winding roller based on a value detected by said detecting means, said control means comprising (i) means for on-off controlling said clutch means at said set operational timings, and (ii) means for setting the timing of stopping of the winding roller at the time of the stopping of the machine according to a detected value of said detecting means so that the time for low-speed rotation of the winding roller prior to the stopping thereof is prolonged as the quantity of the wound yarn on said yarn package becomes large.

4,163,359

METHOD AND APPARATUS FOR DRIVING AND PIECING-UP OPEN-END SPINNING UNITS

Takeshige Honjo, Suita, Japan, assignor to Murata Kikai Kabushiki Kaisha, Japan

Filed Jan. 6, 1975, Ser. No. 538,589
Claims priority, application Japan, Jan. 14, 1974, 49-7217
Int. Cl.[2] D01H *1/30, 15/00*
U.S. Cl. 57—93 **5 Claims**



1. A driving device for an open-end spinning system formed by a number of juxtaposed spinning units each comprising a rotor, a feed roller for supplying a sliver into the rotor, and a package driving drum for taking spun yarn out of the rotor, said device being characterized by a main drive transmission system and an auxiliary drive transmission system provided in common to said spinning units each of which spinning units is operatively linked with said main and auxiliary transmission systems so as to be switched separately and individually from high speed operation to low speed operation and vice versa with the aid of said transmission systems, said auxiliary transmission system including two separate drive sources for each of said spinning units, one of said separate drive sources being connected to said rotor of the associated spinning unit and the other of said separate drive sources being connected to both said feed roller and said package driving drum of the associated spinning unit, said drive sources having different speed changing modes, said main and auxiliary driving systems each including a separate transmission belt for driving the rotor.

4. A method of open-end spinning of thread, comprising the steps of:

(A) twisting the open end of the thread at a pre-determined twisting rate;

(B) drawing off the thread at a pre-determined draw-off speed; and

(C) increasing the numerical ratio of said twisting rate to said draw-off speed whenever the thread is being reattached to the roving and whenever a thread breakage is being repaired, wherein the step of increasing the ratio of said

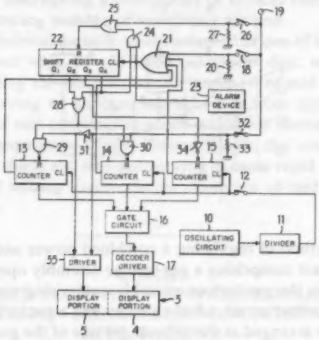
twisting rate to said draw-off speed is performed while said twisting rate is lower than it is during normal spinning machine operation.

4,163,360

TIMER DEVICE

Kojiro Tanaka, and Kazuhiro Yoda, both of Tokyo, Japan, assignors to Kabushiki Kaisha Daini Seikosha, Japan

Continuation of Ser. No. 745,377, Nov. 26, 1976, abandoned. This application Jul. 31, 1978, Ser. No. 929,110
Claims priority, application Japan, Nov. 27, 1975, 50-41921
Int. Cl.[2] G04C *21/00, 21/34*
U.S. Cl. 58—39.5 **5 Claims**



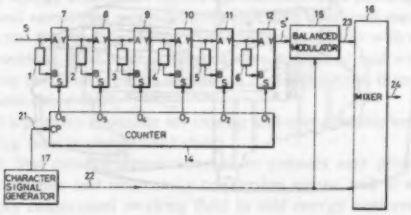
1. An event timer device, comprising: a plurality of memory counters each for memorizing the duration of a respective one of a plurality of different events each having a respective different predetermined duration; selecting means for selecting one of said memory counters corresponding to a selected event and for operating the selected memory counter to count down the memorized duration of the selected event; time display means comprising a single display for displaying a remaining time of the selected event; and event display means cooperative with said selecting means for displaying which event is selected.

4,163,361

TELEVISION TIME SIGNAL GENERATOR

Tsuneo Mikado, Hachioji, Japan, assignor to Nippon Television Industry Corporation, Hachioji, Japan

Filed Apr. 1, 1977, Ser. No. 783,775
Claims priority, application Japan, Jun. 15, 1976, 51-69934
Int. Cl.[2] G04B *19/34*
U.S. Cl. 58—50 R **8 Claims**



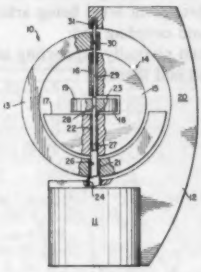
1. A television time signal generator, comprising: a pattern signal generator for generating a pattern signal for time display of numerals on a television picture tube and means for applying to said pattern signal a color component which varies in a predetermined order in accordance with a passage of time, whereby the color of said time display is varied in said predetermined order to represent the value of time increments.

4,163,362

ORBITAL CLOCK

Ronald L. Ferina, 349 Bellmore Rd., East Meadow, N.Y. 11554

Filed Oct. 25, 1977, Ser. No. 845,026
Int. Cl.[2] G04B *19/00*
U.S. Cl. 58—126 R **7 Claims**



1. In a timepiece, means for visually displaying the time of day, which comprises

(a) a clock mechanism having a minutes drive shaft and an hours drive shaft,

(b) a first asymmetrical, three-dimensional body in driving engagement with and partially supported by said hours drive shaft at a first portion thereof, said first body having a height dimension which is substantially larger than the width dimension thereof,

(c) a second asymmetrical, three-dimensional body in driving engagement with and partially supported by said minutes drive shaft at a first portion thereof, said second body having a height dimension which is substantially larger than the width dimension thereof,

(d) a stationary reference member positioned adjacent said first and second asymmetrical bodies, and

(e) a secondary support means in a moving fit relation to each of said bodies for partially supporting said bodies at second portions thereof,

(f) said second portion of each body being spaced from said first portions in the height direction,

(g) said asymmetrical bodies being arranged and configured whereby they are rotatable by said hours and minutes drive shafts, respectively, about an axis whereby the spacial relation between said bodies and the reference member indicates the time of day.

4,163,363

CHAIN LINK BENDING MACHINE

Herbert Windelbandt, Aachen-Laurensberg, and Günter Ditges, Rodenkirchen-Weiss, both of Fed. Rep. of Germany, assignors to Meyer, Roth & Pastor Maschinenfabrik GmbH, Cologne, Fed. Rep. of Germany

Division of Ser. No. 704,685, Jul. 12, 1976, Pat. No. 4,123,899. This application Sep. 21, 1978, Ser. No. 944,315
Claims priority, application Fed. Rep. of Germany, Jul. 12, 1975, 2531290
Int. Cl.[2] B21L *1/02*
U.S. Cl. 59—27 **3 Claims**

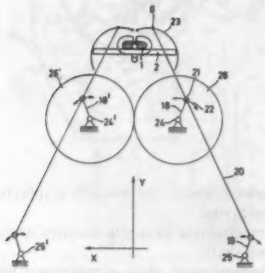
1. In a chain link bending machine for forming chain links from wire pins each having a given length and two free ends; the machine including a mandrel having opposite curved work faces each having a center of curvature; bending tools having means for engaging end zones of the wire pin to provide contact locations between each end zone and the respective work tool for bending each wire pin in a bending plane about the work faces of the mandrel during the bending operation; the improvement comprising guide means for guiding said bending tools in a path having, at least in the terminal phase of the bending operation, at least the approximate shape of a circular involute, the reference point of which coinciding with

the center of curvature of the respective work faces; said guide means including a separate pivotal lever linkage associated with each bending tool; each pivotal lever linkage having

(a) a coupling rod having first and second ends; said first end of said coupling rod pivotally supporting the respective bending tool;

(b) a first pivot lever having first and second ends; said first end of said first pivot lever being articulated to said second end of said coupling rod;

(c) a first fulcrum pivotally supporting said first pivot lever at said second end thereof;



(d) a second pivot lever having first and second ends; said first end of said second pivot lever being articulated to said coupling rod at a location between said first and second ends of said coupling rod;

(e) a second fulcrum pivotally supporting said second pivot lever at said second end thereof; said first and second pivot levers being parallel to one another; and

(f) means for driving each pivotal lever linkage with a pin bending force.

4,163,364

METHOD FOR RECOVERING ENERGY POSSESSED BY EXHAUST GAS FROM BLAST FURNACE

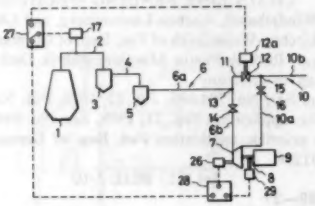
Takeshi Shirato, and Kiyomi Teshima, both of Tamano, Japan, assignors to Mitsui Engineering & Shipbuilding Co., Ltd., Tokyo, Japan

Filed Jan. 5, 1978, Ser. No. 867,278

Claims priority, application Japan, Feb. 15, 1977, 52/15817

Int. Cl.[2] F02C *9/02*

U.S. Cl. 60—39.02 **7 Claims**



1. A method for recovering energy possessed by exhaust gas from a blast furnace which comprises introducing the exhaust gas from the blast furnace into a turbine, converting a part of the energy possessed by the exhaust gas to an energy for rotating the rotation shaft of the turbine and recovering the energy in the form of an electric energy, wherein an axial flow turbine is used as the turbine and the attachment angle of stationary blades of said turbine is changed according to variations of the furnace top pressure of the blast furnace so as to control the furnace top pressure at a predetermined level.

4,163,365

METHOD FOR REGULATING A POWER PLANT CONTAINING A GAS TURBINE ASSEMBLY AND APPARATUS FOR THE PERFORMANCE OF THE AFORESAID METHOD

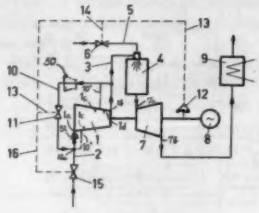
Hansulrich Frutschi, Riniken, Switzerland, assignor to BBC Brown, Boveri & Company Limited, Baden, Switzerland

Filed Nov. 14, 1977, Ser. No. 851,279

Claims priority, application Switzerland, Dec. 2, 1976, 15174/76

Int. Cl.[2] F02C *3/06, 9/14*

U.S. Cl. 60—39.03 **6 Claims**



1. A method of regulating a combined power and heat generating plant comprising a gas turbine assembly operated in an open cycle, the gas turbine assembly comprising a compressor for the combustion air, a fuel chamber and a gas turbine, a heat exchanger arranged at the exhaust gas side of the gas turbine in which there is utilized the thermal energy still contained in the exhaust gases of the gas turbine for heating purposes, the improvement which comprises the steps of:

returning a variable quantity of air heated by the compressor back through a return flow path for the combustion air to a location in front of the compressor, in order to regulate the heating output of the heat exchanger by the exhaust gases of the gas turbine; and

at least partially reducing the pressure energy contained in the heated air by feeding the returned air through an expansion turbine arranged in the return flow path.

4,163,366

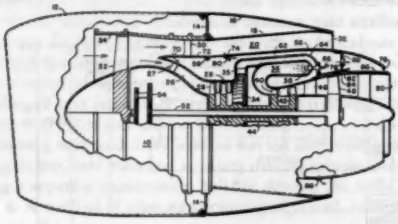
APPARATUS FOR DISPOSAL OF LEAKING FLUIDS IN A TURBOFAN ENGINE

Peter Kent, Stratford, Conn., assignor to Avco Corporation, Stratford, Conn.

Filed May 23, 1977, Ser. No. 799,351

Int. Cl.[2] F02K *3/04, 11/04;* **F02C** *7/30*

U.S. Cl. 60—226 R **4 Claims**



1. In combination with a turbofan engine having a leaking fluid disposal apparatus of the type wherein ventilating air from the bypass ducting is drawn through ports in the cowl separating the bypass ducting and the core engine stages, the cowl having at its midsection in the area containing the engine fuel lines, a diameter sufficient to form between said cowl and said core engine stages an annular shaped cavity through which said ventilating air flows, and wherein means are in-

cluded for exhausting the combination of ventilating air and vaporized leakage fluids into the confluence of the bypass airstream and the gases emitted from the tailpipe of said core engine stages, the improvement which comprises:

turbulent flow inducing means for directing the flow of ventilating air being brought through said ports in said cowl into all cavities around the exterior of said core engine stages, said turbulent flow of air causing vaporization of all leaking fluids, said turbulent flow inducing means including

(a) a bulkhead spacer disc of annular configuration positioned just aft of said engine fuel lines and having its outer periphery attached to the inner wall of said cowl, said spacer disc having a multiplicity of orifices therethrough for allowing passage of ventilating air, and

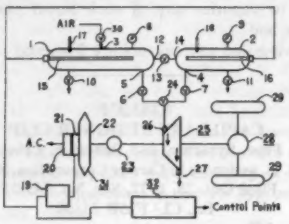
(b) a cylindrical metallic shield attached at one of its ends to the inner edge of said bulkhead spacer disc, said shield encircling the hot core engine stages aft of said fuel lines and serving to prevent leaking fluids from striking surfaces of said core engine stages which are above the ignition temperature of said leaking liquids, the combination of said shield and said disc serving to cause rapid vaporization of leaking liquids during operation of said turbofan engine.

4,163,367

HYBRID FLYWHEEL/COMPRESSED-FLUID PROPULSION SYSTEM FOR NONSTATIONARY APPLICATIONS

George C. Yeh, 2 Smedley Dr., Newtown Square, Pa. 19073

Filed Jan. 9, 1978, Ser. No. 867,694
Int. Cl.[2] F15B *1/02*
U.S. Cl. 60—414 **6 Claims**



1. A hybrid flywheel/compressed-fluid propulsion system for a self-propelled object, said system comprising:

(A) a rotatable drive shaft adapted to propel said object when rotated;

(B) energy conversion means connected to said drive shaft and employing a compressible working fluid, said energy conversion means being adapted, when supplied with said working fluid in a compressed state, to expand said working fluid and produce shaft work for transmission through said drive shaft;

(C) a primary container for storing said compressible working fluid in compressed state;

(D) first conduit means adapted to connect said primary container and said energy conversion means, and to supply compressed working fluid to said energy conversion means;

(E) first valve means interrrupting said first conduit means and adapted to selectively control the flow of compressed working fluid to said conversion means; and

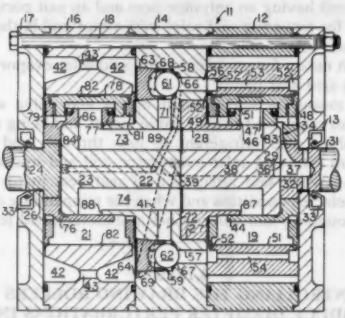
(F) a flywheel connected to said drive shaft through disconnecting means adapted to selectively connect said disconnect, independent of said conversion means, said flywheel from said drive shaft.

4,163,368

CENTRIFUGAL REPLENISHING PUMP FOR A HYDROSTATIC PUMP MOTOR SYSTEM

William K. Engel, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed May 20, 1977, Ser. No. 798,953
Int. Cl.[2] F16D *31/02*
U.S. Cl. 60—488 **5 Claims**



1. In an hydrostatic pump-motor system including a housing enclosing a hydrostatic pump having rotor means with an input shaft thereto and an hydrostatic motor driven by hydraulic fluid forced from said pump, the improvement comprising:

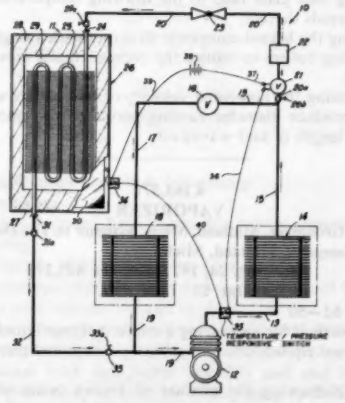
centrifugal pump means integral with said rotor means and internally within said housing and in driven connection with said input shaft, the centrifugal pump means replenishing said pump by providing an additional source of hydraulic fluid thereto; and, a plurality of passageways within said housing which communicate a sump chamber for said system to the centrifugal pump means, which communicate outlet hydraulic fluid from the centrifugal means to fluid inlets for said hydrostatic pump, and which communicate pressurized fluid from said centrifugal pump to bearing surfaces of said hydrostatic motor.

4,163,369

AIR-TO-AIR HEAT PUMP

Charles Owen, 2120 Cannon Way, Marietta, Ga. 30064

Filed May 11, 1978, Ser. No. 904,924
Int. Cl.[2] F25B *27/00*
U.S. Cl. 62—2 **16 Claims**



1. An improvement in the heating cycle of an air-to-air heat pump of the type having a motor driven compressor, a con-

denser, a first refrigerant line interconnecting said compressor and said condenser, an expansion valve, a second refrigerant line interconnecting said condenser and said expansion valve, an evaporator, a third refrigerant line interconnecting said expansion valve and said evaporator and a fourth refrigerant line interconnecting said evaporator and said compressor, the improvement comprising:

means for selectively increasing the temperature of the refrigerant within said fourth line including a solar evaporator coil having an entrance port and an exit port,

means for mounting said solar evaporator coil in the path of radiant solar energy,

conduit means for communicating said solar evaporator coil with said heat pump,

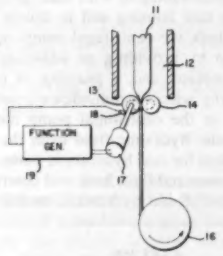
valve means on said conduit means and valve actuating means connected to said valve means and being operable to allow said refrigerant to pass through said conduit means into said solar evaporator coil and into said heat pump when said refrigerant in said heat pump meets a preselected condition and when the temperature of the air surrounding said coil reaches a predetermined level.

4,163,370

CONTROLLING THE DRAWING ROLLERS TO PRODUCE DIAMETER PERTURBATIONS IN AN OPTICAL WAVEGUIDE

Thomas C. Kurth, Charleston, S.C., assignor to Corning Glass Works, Corning, N.Y.

Filed Nov. 21, 1977, Ser. No. 853,755
Int. Cl.[2] C03B *37/00*
U.S. Cl. 65—2 **4 Claims**



1. The method of producing an optical waveguide comprising:

providing a glass tube having a core with an index of refraction higher than the cladding thereof,

heating said glass tube to the drawing temperature of the materials thereof,

drawing the heated composite structure with a single pair of pulling rollers to reduce the cross-sectional area thereof, and

controlling the tangential velocity of said rollers with time to produce diameter varying perturbations spaced along the length of said waveguide.

4,163,371

VAPORIZER

Greg D. Groninger, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Aug. 24, 1977, Ser. No. 827,275
Int. Cl.[2] F17C *7/02*
U.S. Cl. 62—50 **6 Claims**

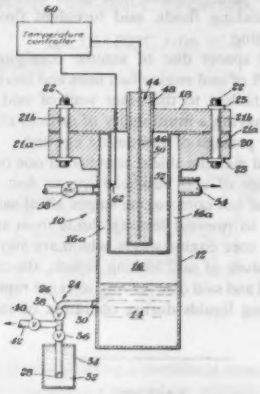
1. A method for vaporizing a mixture of two liquefied gases in chemical equilibrium with a binary compound thereof comprising:

(a) withdrawing the mixture of known composition at a known temperature and a known pressure as a liquid from a supply source;

(b) introducing the liquid mixture through a liquid supply means into a liquid zone of an enclosed vessel to form a liquid phase;

(c) maintaining the uppermost level of said liquid phase at least above that portion of the liquid zone in communication with the liquid supply means;

(d) heating a portion of said liquid phase in said enclosed vessel which is located above said liquid phase which is in



communication with said liquid supply means to a temperature above the dew point temperature corresponding to vapor having substantially the same composition as the liquefied gas mixture thereby to vaporize a portion of such liquid phase to form such vapor and super heating said vapor to vaporize any of such liquid phase dispersed therein; and

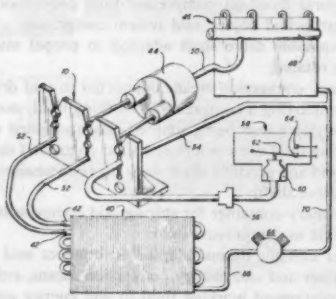
(e) removing said gaseous mixture from said vessel.

4,163,372

CAPILLARY RETAINER CLIP

Leonard V. Frye, Syracuse, and Robert F. Crossman, DeWitt, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Oct. 25, 1977, Ser. No. 845,020
Int. Cl.[2] F25B *25/00*
U.S. Cl. 62—259 **6 Claims**



1. A refrigeration machine comprising a condenser, an evaporator, an expansion control device and a compressor for forming a closed refrigeration circuit, the expansion control device including a capillary tube mounted to conduct refrigerant from the condenser to the evaporator and means for supporting the capillary tube intermediate the ends thereof, said means including a retainer having a plurality of spaced resilient

sections, the sections being formed to define elongated openings therebetween, the confronting sides of which form a spaced region adapted to forcibly engage the exterior surface of the capillary tube as it is passed through said elongated opening.

4,163,373

DEVICE FOR EXTRACTING MOISTURE FROM A SPACE

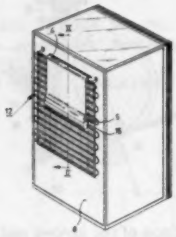
Willem L. N. van der Sluijs, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 12, 1977, Ser. No. 859,645

Claims priority, application Netherlands, Jul. 2, 1977, 7701242

Int. Cl.[2] F25B *47/00*

U.S. Cl. 62—279 **7 Claims**



1. A refrigerator, which comprises an external wall providing an enclosed evaporator space; an evaporator positioned in said space; a vertically disposed condensor arranged outside the refrigerator wall; a pair of openings formed in the refrigerator wall, said openings being respectively at the corresponding ends of the evaporator; a continuous length of capillary material extending past the evaporator in contact therewith, through one of said openings, and extending past the condensor in contact therewith; and a hygroscopic liquid contained in said continuous length of capillary material for absorption of moisture in said evaporator space and for elimination of moisture outside the refrigerator wall, said hygroscopic liquid having a melting temperature lower than the lowest temperature occurring adjacent the evaporator; the two ends of the continuous length of capillary material being in liquid-transmitting contact with each other so that the hygroscopic liquid flows in a closed circuit.

4,163,374

REFRIGERATABLE BEVERAGE CONTAINER HOLDER

Stanley R. Moore; Thomas L. Crisman, and Donald R. Zivney, all of Dallas, Tex., assignors to Freeze Sleeves of America, Inc., Dallas, Tex.

Filed Dec. 21, 1977, Ser. No. 862,970

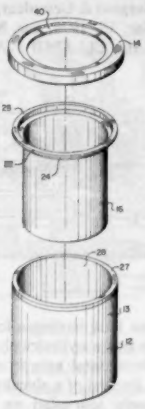
Int. Cl.[2] F25D *3/08*

U.S. Cl. 62—457 **11 Claims**

1. A refrigerated holder for a beverage container of the type including a cylindrical outer cup of insulative material closed on one end and open on the other, the circular edges of the open end being covered by a circular retaining ring including a first portion extending radially across the top edges and into the open end with flap portions to position a cylindrical beverage container in axial alignment with said outer cup and a second, cylindrical portion extending from the top of the cup down the outer wall to retain the ring in position around the cup, the improvement comprising:

a cylindrical inner cup having an outer diameter less than the inner diameter of the outer cup to define an annular space therebetween and an inner diameter for receiving the cylindrical walls of a beverage container therein, said inner cup also including a radially extending flange region at the open end for positioning adjacent the top edges of the outer cup beneath the retaining ring to seal the annular space therebeneath;

a freezable fluid positioned within the annular space between



the outer walls of the inner cup and the inner walls of the outer cup for absorbing heat from the walls of a beverage container positioned within the inner cup when said fluid is frozen to cool the beverage within the container.

4,163,375

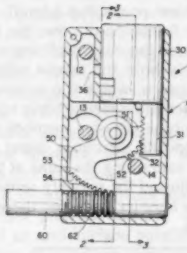
RIGHT ANGLE LOCK

Roy K. Fujitaki, Altadena, Calif., assignor to VSI Corporation, Pasadena, Calif.

Filed Jan. 16, 1978, Ser. No. 869,549

Int. Cl.[2] E05B *65/06; E05C 1/06*

U.S. Cl. 70—134 **25 Claims**



1. A right angle door lock comprising:

(a) a housing,

(b) a key-operated barrel assembly axially slidable in said housing;

(c) an axially slidable bolt in said housing;

(d) means mounting said barrel assembly and said bolt with their axes intersecting and coplanar, and

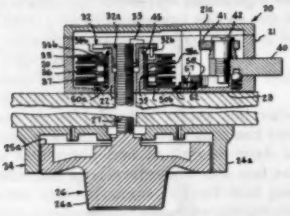
(e) means engaging said bolt and said barrel assembly for causing conjoint movement thereof, comprising a pinion coplanar with said barrel assembly and said bolt, said barrel assembly and said bolt comprising racks, said racks being substantially coplanar;

(f) whereby said lock may be of small thickness transverse to the plane of said axes.

4,163,376
TUMBLER WHEEL COMBINATION LOCKS WITH TORQUE ADJUSTER MEANS

Benson L. Miller, and Steven Helesfai, both of Nicholasville, Ky., assignors to Sargent & Greenleaf, Inc., Nicholasville, Ky.

Filed Mar. 15, 1978, Ser. No. 886,922
Int. Cl.[2] E05B *37/08*
U.S. Cl. 70—303 A 24 Claims



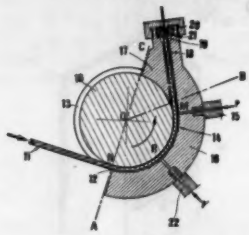
1. In a combination lock having a lock case provided with front and rear walls and a cylindrical tumbler post normally extending along a horizontal axis from one of said walls, a tumbler wheel stack formed of a plurality of peripherally gated tumbler wheels loosely journaled on said tumbler post for rotation about the axis of the tumbler post, retainer shoulder means on an end portion of the tumbler post for retaining the tumbler wheel stack thereon, a peripherally gated rotatable driving cam driven by a rotatable dial, means for driving the tumbler wheels responsive to rotation of the dial and driving cam, and a fence lever pivotally connected to a bolt for shifting the bolt between locked and unlocked positions; the improvement comprising means for adjusting the torque properties of the tumbler wheel stack including stationary inclined ramp means adjacent said tumbler post and facing toward the tumbler stack providing inclined ramp cam surfaces, a torque adjuster spring member journaled for rotation on the tumbler post between said inclined ramp means and the nearest tumbler wheel having cam follower formations bearing against said inclined ramp cam surfaces to track along the latter and having an abutment portion for asserting resilient forces directed axially against the nearest tumbler wheel urging the stack of tumbler wheels compressively against said retainer shoulder means for varying the compressive spring forces on and torque properties of the stack of tumbler wheels in accordance with the positions of the cam follower formations on the inclined ramp surfaces, and the torque adjuster spring member including an extension portion projecting laterally of the tumbler post having a coupler formation thereon, the lock case having interfitting means carried thereby interfitting with said coupler formation to releasably hold the torque adjuster member at various angular positions to which it is adjusted, and the coupler formation and interfitting means being relatively movable for rotation of the torque adjuster member through arcuate paths in either of opposite directions about the axis of said tumbler post and for restraining the same at the angular position to which it is adjusted for variably setting resilient compressive forces on the tumbler stack and thereby adjusting the torque characteristics.

4,163,377
CONTINUOUS HYDROSTATIC EXTRUSION PROCESS AND APPARATUS

Marc Moreau, Asnieres, France, assignor to Trefimetaux, Argenteuil, France

Continuation-in-part of Ser. No. 740,489, Nov. 10, 1976, Pat. No. 4,111,023, which is a division of Ser. No. 676,908, Apr. 14, 1976, Pat. No. 4,041,745. This application Oct. 31, 1977, Ser. No. 847,098
Foreign Application Priority Data Dec. 7, 1976 [FR] France 7637556
Int. Cl.[2] B21C *23/32, 33/00, 23/01, 23/22*
U.S. Cl. 72—60 10 Claims

1. Apparatus for continuous hydrostatic extrusion of a first object, referred to as a blank, of indefinite length, into the form of a second object, which is also of indefinite length but of different section; the apparatus comprising two co-operating coaxial members, one being a movable member, referred to as a rotor, and carrying at its surface a groove of revolution, defined by a pair of opposed side walls and a bottom, which is adapted to receive the blank to be extruded in contact with at least two of said walls and bottom to define separate outward and inward zones respectively above and below the points of contact with said two of said walls and bottom, the other member being fixed, referred to as a stator, and forming, over a first sector of the groove to contain the blank and a viscous fluid, a cover which is substantially sealed with respect to fluid, the stator also comprising, over a second sector of the groove disposed downstream of the first sector, a relief portion which

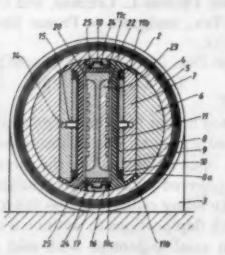


totally blocks the section of the groove and which is precisely adapted thereto to seal the section of the groove relative to the viscous fluid, means for supplying solely the outward zone of the groove with viscous fluid under high pressure from a pressure generator which can be of known type, and an aperture disposed in the stator opposite the first sector of the groove, in the vicinity of the second sector, the aperture opening by way of an elongate conduit which passes through the stator, into an extrusion chamber which communicates with the exterior through at least one die orifice, the viscous fluid supply means producing in the first sector of the groove a pressure gradient from a point of entry for the blank, at ambient pressure, to the conduit which opens into the chamber in which the extrusion pressure exists.

4,163,378
HYDRAULIC PRESS

Keijo E. Hellgren, Vesteras, Sweden, assignor to ASEA Aktiebolag, Vesteras, Sweden

Filed Jun. 21, 1978, Ser. No. 917,503
Claims priority, application Sweden, Jun. 27, 1977, 7707358
Int. Cl.[2] B21D *22/12*
U.S. Cl. 72—63 7 Claims



1. A hydraulic press for forming sheet material, comprising:
a horizontally extending press stand including a vertically extending forming cavity formed therein between a pair of spaced forming pads extending between the inner surfaces of said press stand, and an elastically deformable member extending between the respective end of each said forming pad for supporting the same;

a tool carrier movable into, and out of, said forming cavity and including an upstanding tool support member having a tool forming depression on each side thereof on which sheet material is formed, said tool carrier dividing said forming cavity into a pressure cell on each side of said upstanding tool support member; and

means for injecting a pressure medium into each of said pressure cells.

4,163,379

APPARATUS FOR PERFORMING A WORKING OPERATION ON THE TIP OR POINT OF A BALL POINT PEN

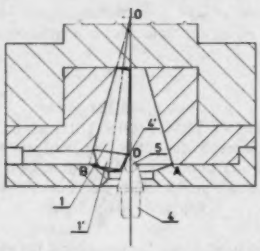
Ugo Buzzi, Arzo, Switzerland, assignor to Albe S.A., Agno, Switzerland

Filed Jan. 31, 1978, Ser. No. 873,835

Claims priority, application Switzerland, Feb. 2, 1977, 1291/77; Nov. 29, 1977, 14634/77

Int. Cl.² B21D *19/06*

U.S. Cl. 72—121 **9 Claims**



1. An apparatus for performing a working operation on the tip of a ball point pen, especially a tip which is made of a hard material, such as stainless steel, comprising three similar working rollers arranged to roll without slip on a seating as a tip is being worked on the apparatus, each of said rollers having a conical or frusto-conical running surface which in use runs on the seating, which is also conical or frusto-conical, and the apex of the cone defined by the seating coinciding with the apex of each cone defined by each of the running surfaces, each of the rollers having at one end a working surface arranged so that all three working surfaces will operatively engage a ball point pen tip when operatively positioned to be worked by the apparatus by being presented along the axis of the cone defining the seating surface.

4,163,380

FORMING OF PRECONSOLIDATED METAL MATRIX COMPOSITES

Vernon W. Masoner, Woodstock, Ga., assignor to Lockheed Corporation, Burbank, Calif.

Filed Oct. 11, 1977, Ser. No. 841,005

Int. Cl.² B21D *5/00*

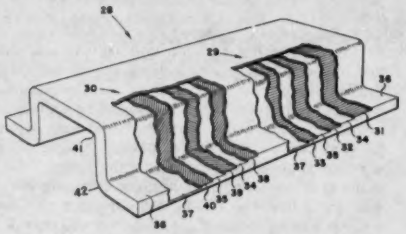
U.S. Cl. 72—342 **21 Claims**

1. A method of forming bends or deflections in a preconsolidated metal matrix composite workpiece consisting of boron, borsic, alumina or graphite filaments in aluminum or titanium base metals, said method comprising the steps of:

(a) locating the composite workpiece between open male and female members of a forming die;

(b) bringing the workpiece and at least the die faces to a temperature of from approximately 910° F. to approximately 935° F.; and,

(c) closing the die members at a rate of from 5 to 12 mils per minute after both male and female die members are in



contact with the workpiece and until the die members are completely closed.

4,163,381

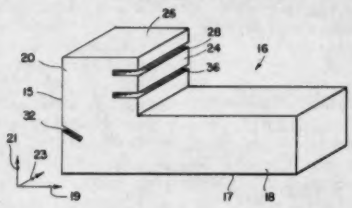
METHOD AND APPARATUS FOR MAKING A TROPHY COLUMN

Jack R. Hodshon, 2363 Cecelia La., Clearwater, Fla. 33515

Filed Jun. 19, 1978, Ser. No. 916,771

Int. Cl.² B21D *31/00*

U.S. Cl. 72—477 **7 Claims**



1. A metal working hand tool for making a two-piece, four sided, metal trophy column having a housing formed from a first piece of sheet metal forming three of said sides with longitudinal clasp portions at the terminating edges of the first and third of said sides and a decorative insert formed from a second piece of sheet metal forming the fourth one of said sides with longitudinal clasp engaging portions at the terminating edges thereof which engage said clasps on said housing, comprising:

an L-shaped body having a long handle segment with a principal outside surface along a length direction and a short metal engaging segment with a principal outside surface along a width direction perpendicular to said length direction, the L-shaped body having a depth along a longitudinal direction mutually perpendicular to said length and width directions;

said short metal engaging segment having an inside surface parallel to said principal outside surface of said short segment and an end surface parallel with said principal outside surface of said long segment;

a first slot in said inside surface, parallel with said end surface, having a depth approximately equal to the length of a first segment of said longitudinal clasp portion, located at a distance from said end surface approximately equal to the length of a second segment of said longitudinal clasp portion, for securing a first end of said first piece of sheet metal while it is being sequentially bent over said inside surface, said end surface and said outside surface of said short segment and over said outside surface of said long segment, forming one of said longitudinal clasp portions on one edge of said first side of said housing;

said inside and outside surface of said short segment being separated by a distance approximately equal to the length of a third segment of said longitudinal clasp portion and

said end surface of said short segment and said outside surface of said long segment being separated by a distance approximately equal to the length of said first side of said housing;

a second slot in said outside surface of said short segment, having an opening parallel with said outside surface of said long segment, having a depth approximately equal to the length of a first segment of said longitudinal clasp engaging portion, said depth being at an acute angle with respect to said outside surface of said long segment, located at a distance from said outside surface of said long segment approximately equal to the length of a second segment of said longitudinal clasp engaging portion, for securing a first end of said second piece of sheet metal while it is being sequentially bent over said outside surface of said short segment and said outside surface of said long segment, forming one of said longitudinal clasp engaging portions on one edge of said decorative insert;

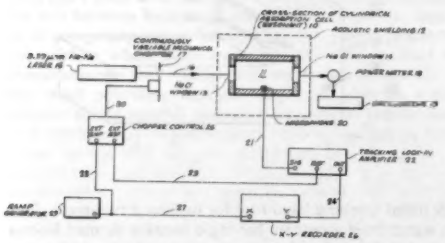
whereby a two-piece metal trophy column may be made.

4,163,382

METHOD AND APPARATUS FOR OPTOACOUSTIC SPECTROSCOPY

Nabil M. Amer, Berkeley, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 28, 1978, Ser. No. 901,048
Int. Cl.[2] G01N *31/00, 21/24*
U.S. Cl. 73—24 **10 Claims**



1. An optoacoustic spectroscopy method comprising the steps of containing a gaseous mixture of an optically nonabsorbing gas whose properties are to be determined and an optically absorbing gas, directing pulsed light through the thus contained gaseous mixture such that at least a portion of the energy of the pulsed light is absorbed by the optically absorbing gaseous component of the mixture and communicated to the nonabsorbing gaseous component of the mixture resulting in pulsed acoustic waves, and detecting and measuring the thus produced acoustic waves, such that the velocity of sound in the optically nonabsorbing gas component, the ratio of its specific heat at constant pressure to that at constant volume, its heat conductivity, viscosity, and molecular weight can be determined.

4,163,383

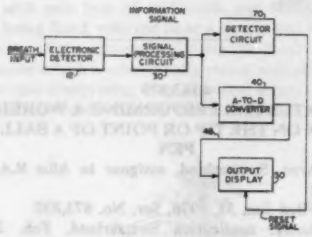
BREATH TESTING SYSTEM

Gary L. VanderSyde, Naperville, Ill., and John Warberg, Scarborough, Canada, assignors to Alcohol Countermeasure Systems Inc., Sarnia, Canada

Filed Mar. 7, 1978, Ser. No. 884,120
Int. Cl.[2] G01N *27/04*
U.S. Cl. 73—27 R **7 Claims**

1. In a biological gas tester of the type in which an electronic detector provides an information signal having an amplitude level which is a function of the alcohol content in the gas under test, including a signal processing circuit for delivering the information signal and an output display for providing an indication of the amplitude of the information signal, which signal is prone to error if the gas under test provides an undesired chemical input to the electronic detector, the improvement which comprises:

an anomaly detector circuit, coupled to the signal processing circuit, for continually comparing the maximum value of the information signal with the instantaneous value of the information signal, and means for providing a signal to



modify operation of the output display when the rate of decrease of the information signal provides an amplitude difference between the instantaneous value and the maximum value of the information signal which indicates presence of an anomalous chemical substance in the gas under test.

4,163,384

PIEZOELECTRIC MOISTURE ANALYZERS

Colin B. Blakemore, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 14, 1978, Ser. No. 896,449
Int. Cl.[2] G01N *31/00*
U.S. Cl. 73—29 **7 Claims**

1. In a moisture analyzer for measuring the moisture content of a gas stream which contains a first acid gas comprising a piezoelectric crystal coated with a polymer selected from the group consisting of polystyrene sulfonic acid and salts of polystyrene sulfonic acid, the improvement wherein the sensitivity of the coated crystal to water in the presence of acid is stabilized by exposure of the coated crystal to a second acid gas which can be the same or different than the first acid gas for a period of time sufficient to produce stable sensitivity of the coated crystal to moisture in the presence of the first acid gas.

4,163,385

ENGINE KNOCKING METER

Takayuki Kato, Aza; Kazumasa Sumi; Masanori Miyashita, both of Nagoya; Osamu Nomura, Heiwamachi, and Shouzo Naito, Bisai, all of Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho; Toyota Jidosha Kogyo Kabushiki Kaisha and Kabushiki Kaisha Tokai Rika Denki Seisakusho, all of Aichi, Japan

Filed Jun. 29, 1977, Ser. No. 811,207
Claims priority, application Japan, Jun. 30, 1976, 51-77371
Int. Cl.[2] G01M *15/00*; G01N *33/22*
U.S. Cl. 73—35 **11 Claims**

1. An engine knocking meter comprising:

a first means for detecting a combustion pressure signal based on pressure in cylinders of an engine;

a second means for supplying those frequency components of said pressure signal which correspond to a predetermined frequency band of an engine knock signal, as a pressure signal.

a crank angle sensor having at least a portion thereof mounted on a crank shaft above the engine for detecting a crank angle corresponding to a predetermined knocking region;

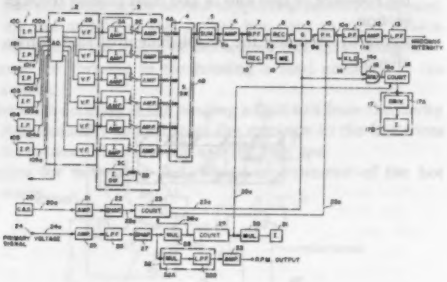
a third means for producing a gate signal based on a detection signal from said crank angle sensor;

a gating means responsive to said pressure signal from said

second means and said gate signal from said third means to gate only that pressure signal which occurs during the presence of said gate signal;

a fourth means for holding a peak value of a signal from said gating mens for each ignition cycle;

a fifth means for detecting a knocking state from a peak hold signal from said fourth means, said fifth means including a



level discriminating means for detecting the peak hold signal above a predetermined level as the knocking signal; and

a means for counting said knocking signals above said predetermined level supplied from said level discriminating means for a period corresponding to a predetermined number of times of ignition and indicating the count.

4,163,386

MASS AND FORCE METER

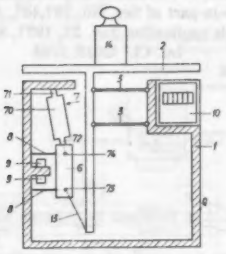
Mario Gallo, and Johannes Wirth, both of Zurich, Switzerland, assignors to Wirth, Gallo & Co., Zurich, Switzerland

Filed Oct. 21, 1977, Ser. No. 844,467

Claims priority, application Switzerland, Sep. 1, 1977, 10642/77

Int. Cl.[2] **G01L** *1/10*

U.S. Cl. 73—141 R **4 Claims**



1. A mass and force meter comprising:

a frame,

a load support,

an evaluation and display means mounted on said frame,

a force distributor,

first and second strings vibrating transversely when electrically excited, said strings being parallel to each other and each having one end fixed to the frame and the other end fixed to said force distributor,

an elastic guide fixed to said frame and to said force distributor so as to be under bending pre-tension for transmitting moments to said force distributor, said guide generating thereby a pre-tensioning force transmitted by said force distributor to said first and second strings,

a transmission element attached to said force distributor and support for transmitting to said first and second strings a force depending on the load placed on said support,

means for applying to the evaluation and display means resultant frequency variations caused by the application of said forces to said strings for computation and display of the magnitude of said load,

said guide and said strings guiding said force distributor in a statically defined way relative to said frame with respect to said pre-tensioning force and said force depending on the load to be measured.

4,163,387

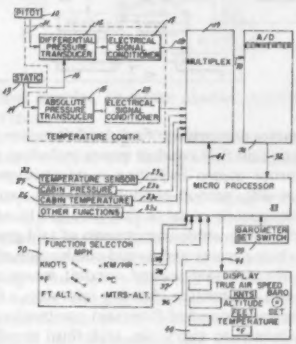
AIRCRAFT CABIN DISPLAY UNIT

Rondon L. Schroeder, 1717 S. Topeka, Wichita, Kans. 67211

Filed Jan. 16, 1978, Ser. No. 869,482

Int. Cl.[2] **G01C** *21/10*

U.S. Cl. 73—178 R **4 Claims**



1. A cabin display unit for an aircraft having a pitot tube output and a static air pressure source;

a. a cabin display unit having first and second inputs,

b. a differential pressure transducer having said first input connected to said pitot tube output and a second input connected to said static air pressure source;

c. an absolute pressure transducer have an input connected to said static air pressure source;

d. a multiplexing means having a plurality of signal inputs, a command input and an output;

e. a first electrical signal conditioner having its input connected to the output of said differential pressure transducer, and its output connected to a signal input of said multiplexing means;

f. a second electrical signal conditioner having its input connected to an output of said absolute pressure tranducer, and its output connected to a second signal input of said multiplexing means;

g. an analog to digital converter means having its input connected to the output of said multiplexing means;

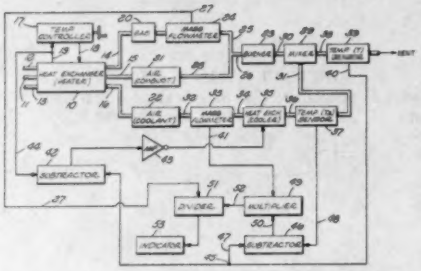
h. a micro-processing unit means having its input connected to an output of said analog to digital converter means and its output connected to said cabin display unit, and having a plurality of function selector inputs and a command output connected to a command input of said multiplexing means, and;

i. function selector means coupled to the inputs of said micro-processing unit for determining the particular mode of display of said display units of the air speed, temperature, and altitude of said aircraft: whereby information from said pitot static tube, and statice pressure source and said temperature and altimeter, when electrically processed and applied to said micro-processing unit will have the true air speed calculated along with the altitude, temperature and other functions calculated and displayed on said cabin display unit.

4,163,388
CALORIMETER

Milton H. November, Hacienda Heights, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Oct. 20, 1978, Ser. No. 953,087
Int. Cl.[2] G01K 17/00
U.S. Cl. 73—190 CV 6 Claims



1. A calorimeter comprising: first conduit means to carry a combustible gas, said first conduit means including a gas mass flowmeter; burner means including a combustion chamber having an inlet side; second conduit means to carry air at a flow rate approximately equal to that required to oxidize substantially all the combustible components of said gas, said first conduit means being connected to said combustion chamber on the inlet side thereof, said second conduit means also being connected to said combustion chamber inlet side; a first heater exchanger; a mixer connected from said combustion chamber; third conduit means to carry air, said third conduit means including an air mass flowmeter said first heat exchanger being actuable in a manner to maintain gas in said first conduit means and air in said second and third conduit means at the same inlet temperature T_2; second heat exchanger having an inlet and an outlet, said third conduit means being connected to the inlet of said second heat exchanger; a first sensor connected from said second heat exchanger outlet to said mixer to produce an output signal proportional to the temperature T_3 of the air entering said mixer; a second sensor for the final temperature at the output of said mixer; computer means responsive to the difference between said final temperature and said inlet temperature to drive said second heat exchanger to cool the air therein in a manner to maintain said final temperature equal to T_2; and means responsive to the output W_1 of said gas flowmeter, the output W_3 said air flowmeter, and said temperature T_3 and one of the other two temperatures for computing an output signal proportional to the term

$$\frac{K_3 W_3 (T - T_3)}{W_1}$$

where W_1 is the mass flow rate of the gas, W_3 is the mass flow rate of the air in said third conduit means, and K_3 is the specific heat of the air flowing in said third conduit means, and T is one of the temperatures T_1 and T_2.

4,163,389
METHOD AND APPARATUS FOR ELECTRICAL MEASUREMENT OF FLUID FLOW RATE

Suzuo Suzuki, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Japan

Filed Dec. 21, 1977, Ser. No. 862,983
Claims priority, application Japan, Dec. 23, 1976, 51/154330
Int. Cl.[2] G01F 1/64
U.S. Cl. 73—194 F 10 Claims

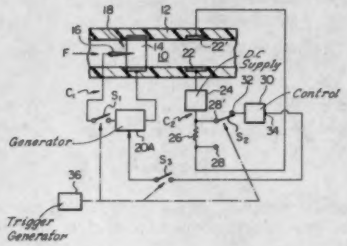
1. A method of measuring the rate of a fluid flow, comprising the steps of:

preparing a DC circuit to allow a current to flow across a flow of a fluid at a section thereof;

continually establishing corona discharge in another section of said flow upstream of said section to partially ionize said fluid such that a constant quantity of ions per unit volume of said fluid are formed;

measuring a current flowing through said DC circuit due to the presence of said ions in said fluid passing through said section;

temporarily stopping the establishment of said corona discharge;



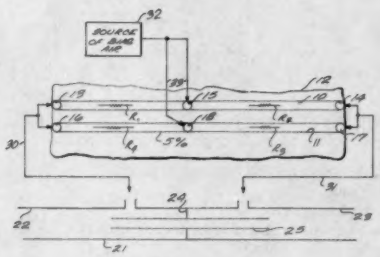
measuring a current flowing through said DC circuit while the establishment of said corona discharge is stopped thereby to detect inherent conductivity of said fluid; and

adjusting at least one of (i) a voltage for establishing said corona discharge; (ii) a voltage impressed on said flow by said DC circuit and (iii) a constant of said DC circuit for detecting a current flowing therethrough such that the intensity of said current flowing through said DC circuit as the result of said corona discharge has a definite relationship with the rate of said flow irrespective of the inherent conductivity of said fluid.

4,163,390
BIPOLAR FLUID MEASURING APPARATUS

Jerome A. Rodder, 774 Sunshine Dr., Los Altos, Calif. 94022

Continuation-in-part of Ser. No. 787,467, Apr. 14, 1977, abandoned. This application Jun. 23, 1977, Ser. No. 809,302
Int. Cl.[2] G01F 1/68
U.S. Cl. 73—204 4 Claims



1. Fluid measuring apparatus comprising:

a housing having an elongated cavity enclosed on its sides;

a first thin elongated hot wire bent in half to extend along the length of the cavity away from a junction;

a second thin elongated hot wire bent in half to extend along the length of the cavity away from the junction in the same direction as the first hot wire so the first and second hot wires are side by side in the cavity;

first means at the junction for supporting the ends of each hot wire in spaced electrically isolated relationship from each other and connecting one end of the first and second

hot wires to each other to form in effect a first single hot wire equal in length to the first and second hot wires;

second means spaced along the length of the cavity from the junction for supporting the middle of the first hot wire to exert tension thereon as the length of the first hot wire changes;

third means spaced along the length of the cavity from the junction aside of the second supporting means for supporting the middle of the second hot wire to exert tension thereon as the length of the second hot wire changes;

means for forming in the housing a fluid entrance to the cavity;

means for forming in the housing a fluid exit from the cavity longitudinally spaced from the entrance so the hot wires lie between the entrance and the exit; and

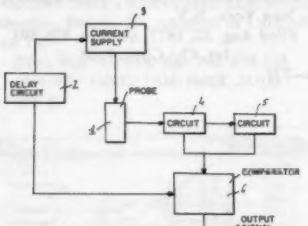
means for measuring the change in resistance of the hot wires.

4,163,391

DEVICE FOR CHECKING THE LEVEL OF A LIQUID IN A TANK

Jean-Jacques Bezard, La Garenne; Charles-Henri Jourdain, Colombes, and Bruno Lalanne, Courbevoie, all of France, assignors to Jaeger, Levallois-Perret, France

Filed Sep. 28, 1977, Ser. No. 837,543
Claims priority, application France, Oct. 6, 1976, 76 30120
Int. Cl.[2] G01F *23/10*
U.S. Cl. 73—295 **10 Claims**



1. Apparatus for monitoring the level of a liquid in a tank, comprising:

an electrical resistance probe having a resistance value which increases with temperature, said probe arranged to be immersed to a level dependent upon the liquid level in said tank such that, when said probe is supplied with a constant current, the temperature and the resistance of said probe increase in dependence on the amount of said probe which is immersed;

means energizable for supplying a constant current through said probe to produce a voltage across said probe dependent on the temperature of said probe; and

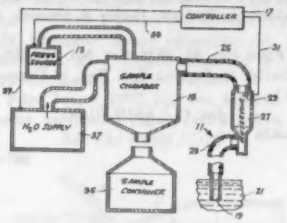
means for comparing the initial voltage across said probe upon energization of said constant current supplying means with the voltage across said probe at a predetermined time after energization of said constant current supplying means, and for providing an indication dependent on said comparison, said indication being representative of the liquid level in said tank and being substantially independent of ambient temperature.

4,163,392

SAMPLER PURGE SYSTEM

Richard P. Fleenor, Santa Cruz, and M. Rinley Deeds, Felton, both of Calif., assignors to Manning Environmental Corp., Santa Cruz, Calif.

Filed Oct. 2, 1978, Ser. No. 947,742
Int. Cl.[2] G01N *1/14*
U.S. Cl. 73—421 B **7 Claims**



1. In a fluid sampler, an intake channel preconditioner system, comprising,

an intake channel having a first end communicating with a fluid to be sampled and having a second end communicating with a sample container,

reversible pressure means communicating with said channel for drawing said fluid up to a predetermined point in said channel and expelling fluid therefrom,

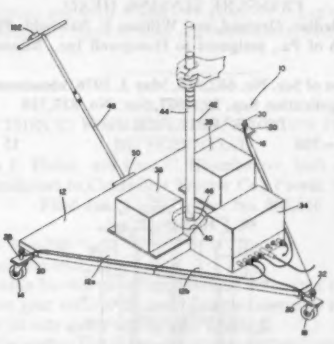
control means connected to said reversible pressure means including a fluid sensor disposed at a predetermined point in said intake channel between said reversible pressure means and the first end of said intake channel and producing a signal on fluid contact, said control means for causing said reversible pressure means to draw and expel fluid in said channel.

4,163,393

VOID DETECTOR SYSTEM

Manuel Gutierrez, Golden, and Phillip F. Enger, Arvada, both of Colo., assignors to The Unites States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Aug. 4, 1978, Ser. No. 931,069
Int. Cl.[2] G01N *29/04*
U.S. Cl. 73—584 **24 Claims**



1. An apparatus for non-destructively testing concrete, comprising:

a platform;

first, second and third vibration receiving transducers on said platform defining the corners of an equilateral triangle, said transducers being mechanically coupled to the concrete being tested and generating vibration responsive electrical signals;

means for imparting vibration to the concrete at a position equispaced from said transducers; and

means responsive to said electrical signals for indicating a condition of the concrete within an area bounded by said transducers.

4,163,394

METHOD OF ULTRASONIC SCANNING OF BODIES

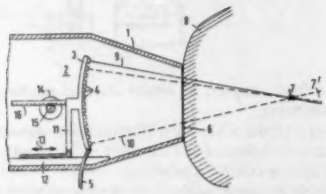
Richard E. Soldner, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jun. 10, 1976, Ser. No. 694,608

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1975, 2529112

Int. Cl.[2] A61B *10/00*

U.S. Cl. 73—626 **2 Claims**



1. The method of scanning internal body regions accessible through narrow acoustic apertures, which comprises:

sequentially directing ultrasonic beams from successive directions toward substantially a common point of convergence at a narrow acoustic aperture within the body such that the beams extend through the acoustic aperture and then diverge along successive scan lines forming a sector scanning configuration within an internal body region beyond the acoustic aperture, and

predominantly utilizing ultrasonic echo signals produced in the sector scanning configuration beyond the point of convergence so as to predominantly provide an ultrasonic echo sectional view of the internal body region beyond such acoustic aperture.

4,163,395

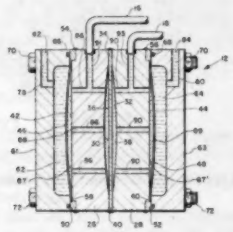
PRESSURE TRANSMITTER WITH SIMPLIFIED PRESSURE SENSING HEAD

Lewis A. Medlar, Oreland, and William F. Newbold, Philadelphia, both of Pa., assignors to Honeywell Inc., Minneapolis, Minn.

Continuation of Ser. No. 682,316, May 3, 1976, abandoned. This application Sep. 29, 1977, Ser. No. 837,714

Int. Cl.[2] G01L *7/08, 19/04*

U.S. Cl. 73—708 **15 Claims**



1. A pressure sensing head comprising

head structure having a substantially flat back-up surface,

a substantially flat, deformable barrier diaphragm of a preselected stiffness having first and second faces and a peripheral edge which is sealed to said surface so that said first face faces said surface,

means for applying a fluid pressure force to said second face which is representative of a fluid pressure to be sensed, said surface physically matching said first face sufficiently to fully back up and support said diaphragm and prevent its deleterious deformation in the presence of values of said fluid pressure force which force said diaphragm to bottom-out against said surface,

a first fluid chamber of expansible volume having fluid communication with said first face, and

a preselected quantity of a substantially incompressible fill fluid completely filling said first chamber and exerting a deforming force on said first face which deforms and bows-out said diaphragm away from said surface into a dome shape to form a second fluid chamber between said first face and said surface which is completely filled with said fluid,

said diaphragm stiffness and said fill fluid quantity, and hence said deforming force, being preselected, in the absence of said fluid pressure force on said second face, to cause said deforming force normally to bow-out said diaphragm by a preselected amount to a normal bowed-out position for which the traversal of said fluid pressure force throughout its normal operating range deflects said diaphram about its said normal bowed-out position to only that extent which causes said diaphragm to deflect without oil canning, and thus to deflect with only an essentially continuous, uniform, unvarying, and consistent deflection vs. pressure characteristic,

whereby the pressure of said fill fluid is consistently representative of said fluid pressure to be sensed throughout said normal operating range.

4,163,396

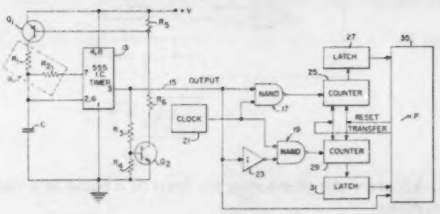
DIGITAL READOUT PRESSURE SENSOR

John B. S. Waugh, Mountain Lakes, N.J., assignor to The Singer Company, New York, N.Y.

Filed Aug. 22, 1977, Ser. No. 826,593

Int. Cl.[2] G01L *9/06*

U.S. Cl. 73—721 **13 Claims**



1. A digital pressure transducer comprising;

a timing circuit having an output including a first level and a second level,

a first resistive element R_1 coupled to said timing circuit with the magnitude of at least said resistive element R_1 determining the time duration T_1 of said first level,

a second resistive element R_2 coupled to said timing circuit with the magnitude of at least the resistive element R_2 determining the time duration T_2 of said second level, and

a pressure transducer including said first and second resistive elements R_1 and R_2;

said first and second resistive elements R_1 and R_2 incorporated in said transducer in such a manner that a change of pressure P increases the resistance of the first resistive element R_1 to increase the time duration T_1 of said first level and decreases the resistance of the second resistor element R_2 to decrease the time duration T_2 of said second level;

the ratio r of the time duration of the first and second levels being indicative of the pressure P at the transducer.

4,163,397

OPTICAL STRAIN GAUGE

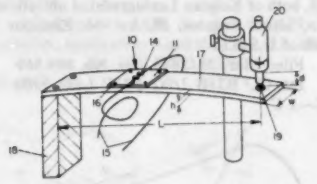
Alan L. Harmer, Geneva, Switzerland, assignor to Battelle Development Corporation, Columbus, Ohio

Filed Oct. 31, 1977, Ser. No. 846,799

Claims priority, application United Kingdom, Jul. 27, 1977, 31643/77

Int. Cl.[2] G01N *3/00*

U.S. Cl. 73—800 **11 Claims**



1. Apparatus for measuring strain in a solid object, comprising a curved light guiding structure comprised of a first medium surrounded by a second medium of lower refractive index than that of the first medium, means for injecting light into the structure and means for analyzing the change in the modal propagation characteristics of the light emerging from the structure, means for attaching the light guiding structure to a solid object in such a way that in use, stresses acting upon the object are translated into changes in the curvature of the structure creating changes in the modal propagation of the injected light.

4,163,398

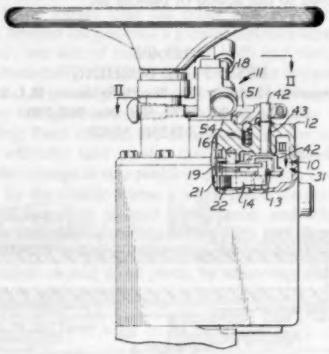
TRANSMISSION SHIFT CONTROL LOCK ASSEMBLY

James E. Johnston, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Feb. 9, 1978, Ser. No. 878,125

Int. Cl.[2] G05G *5/06*; B60K *28/00*

U.S. Cl. 74—483 K **7 Claims**



1. A transmission shift control lock assembly for a transmission shift control having a support structure and a member pivotally connected to the support structure, said member being movable in an arcuate pathway between first and second positions at which the transmission is in forward and reverse drive conditions respectively, said member having an intermediate position at which the transmission is in neutral, comprising:

first and second levers pivotally connected to the support structure and positioned on opposite sides of said member, said levers being movable between a first lever position at which the member is free to move between said first and second positions and a second lever position at which the levers are contacting and maintaining the member at said intermediate position; and

means for moving said first and second levers between said first and second lever positions.

4,163,399

POWER TRANSMISSION WITH PARALLEL CRANKSHAFT, INPUT SHAFT AND OUTPUT SHAFT

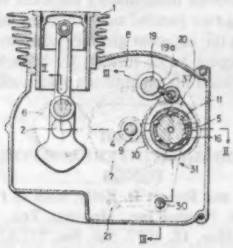
Youji Yamada, Kawagoe; Kunio Miyazaki, Oi, and Masumi Hamane, Kawagoe, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 9, 1977, Ser. No. 805,166

Claims priority, application Japan, Jun. 18, 1976, 51-78964[U]

Int. Cl.[2] F16H *37/08*

U.S. Cl. 74—700 **9 Claims**



1. Power transmission apparatus comprising an internal combustion engine having a crank shaft, a speed-change mechanism having an input shaft and an output shaft, said crank shaft, said input shaft and said output shaft being mounted in three parallel rows, a torque converter disposed at an end portion of said input shaft and drivingly coupled thereto, two axially spaced gears rotatably mounted on said output shaft and driven in rotation from said input shaft, a shift member mounted on said output shaft between said two gears, a shift drum and a guide shaft extending parallel to said output shaft, a shift fork axially movable on said guide shaft and in engagement with said shift member and said shift drum to effect relative axial displacement of said shift member on said output shaft towards said gears and dog clutch means between said shift member and each of said two gears for engaging the same in rotation upon relative axial displacement of said shift member.

4,163,400

THRUST WASHER CONSTRUCTION FOR DIFFERENTIAL

William F. Fisher, and Paul C. Rosenberger, both of Decatur, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Jun. 13, 1977, Ser. No. 806,046

Int. Cl.[2] F16H *1/38*

U.S. Cl. 74—710 **2 Claims**

1. A differential comprising:

a housing having an internal surface defining a chamber;

a drive gear secured to said housing externally thereof;

a pair of side gears within said housing;

a spider within said housing and between said side gears and extending into said housing at spaced locations on said internal surface;

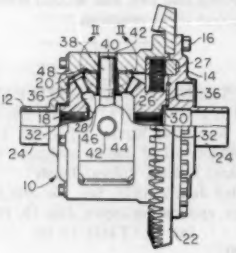
pinions journalled on and carried by said spider within said housing and engaged with said side gears;

a noncircular recess in said internal surface adjacent at least one of said side gears and said pinions; and

a noncircular thrust washer interposed between said internal surface and the one of said side gears and said pinions, said

washer being sized and shaped to be snugly received within said recess and abut the sides thereof over a substantial distance to fix the washer against rotation;

said recess having parallel sides and a flat bottom, said bottom being grooved immediately adjacent said sides, said washer having two parallel sides abutting said recess sides and overlying the adjacent groove, whereby said grooves permit said recess to be formed by broaching and thus eliminate the need for chamfering said washer.

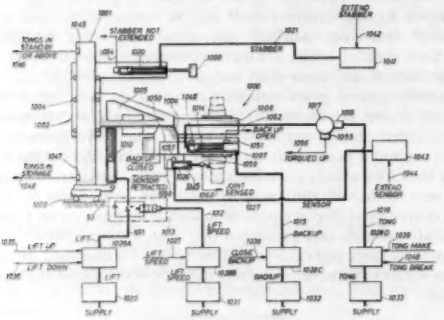


4,163,401

ELECTRO-HYDRAULIC INTERFACE FOR A POWER TONGS

Loren B. Sheldon, and Robert R. Kelly, both of Houston, Tex., assignors to B. J. Hughes Inc., Houston, Tex.

Filed Mar. 15, 1977, Ser. No. 777,672
Int. Cl.[2] B25B *13/50*
U.S. Cl. 81—57.34 **4 Claims**



4. In a power driven tongs including a backup tong and a driven tong, each of the tongs operatively connected to a line for the supply of pressurized fluid thereto, each line having a manually operable valve for controlling the flow of fluid to the tong to which the line is connected, an electro-hydraulic interface module for each line comprising:

an electrically responsive solenoid valve connected in parallel to the manually operable valve;

means for selectively enabling the electrically responsive valve and simultaneously disenabling the manually operable valve, the means including first and second electrically responsive select valves respectively connected to the manually operable valve and to the electrically responsive solenoid valve, the select valves being isolated against communication therebetween; and,

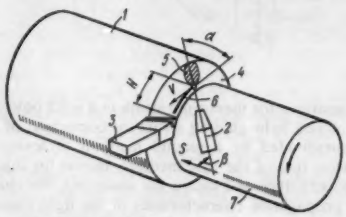
means for simultaneously energizing the first and the second select valves to simultaneously disenable the flow control capability of the manually operable valve and enable the flow control capability of the electrically responsive valve to thereby render the fluid flow in the line susceptible to control by the electrically responsive solenoid valve in response to a predetermined electrical signal.

4,163,402

METHOD OF MACHINING WORKPIECES AFTER PREHEATING

David G. Bykhovsky, ulitsa Esenina, 32, korpus 2, kv. 95, Leningrad; Konstantin P. Alexeev, ulitsa Truda, 15/5, kv. 16, Kolpino Leningradskoi oblasti; Viktor S. Kunin, Lesnoi proezd, 34/36, kv. 80; Valery M. Vassin, ulitsa Michurinskaya, 1, kv. 132, both of Leningrad; Valentin N. Nesterov, ulitsa Proletarskaya, 93, kv. 28; Vladimir A. Alexandrov, ulitsa Zapadnaya, 14, kv. 35, both of Kolpino Leningradskoi oblasti, and Eduard R. Fomin, ulitsa Engelsa, 38, kv. 44, Zhdanov Donetskoi oblasti, all of U.S.S.R.

Filed Mar. 23, 1978, Ser. No. 889,569
Int. Cl.[2] B23B *3/00*; B23C *1/00, 9/00*
U.S. Cl. 82—1 C **4 Claims**



1. A method of machining a workpiece after preheating, comprising

positioning of a plasma torch ahead of a tool so that the angle between the direction of cutting speed and the axis of plasma jet of said plasma torch is up to 45 deg., and the angle between the direction of feed of said tool and the axis of plasma jet of said plasma torch ranges from 10 to 45 deg.;

heating and notching the workpiece material on the surface of cutting thereof to form a groove under the action of the plasma jet of said plasma torch; and

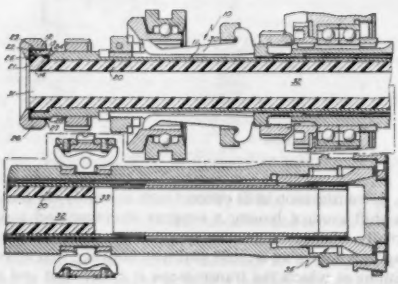
removing by said cutting tool the material of said workpiece, subjected to the action of plasma jet.

4,163,403

FEED TUBE BUSHING

William Argereu, Hickory Dr., North Scituate, R.I. 02857

Filed Apr. 27, 1978, Ser. No. 900,430
Int. Cl.[2] B23B *25/00*
U.S. Cl. 82—38 A **4 Claims**



1. In combination with a machine having a tool operating upon a bar from which the work is formed including a tube through which the bar is fed, a chuck for gripping the bar, a non metallic resilient member of a length greater than half the

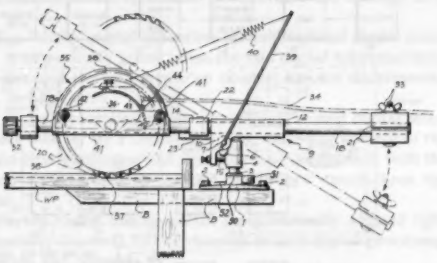
length of the tube within and fitting the inner diameter of the tube, said tube having an enlarged entrance opening at one end forming a shoulder spaced inwardly from said entrance end, said member having an enlarged head, a collar fixed on said head at said entrance end with its inner edge engaging said shoulder and a cap on the entrance end of said tube engaging the outer end of said collar to hold said member against said shoulder fixed in said tube.

4,163,404

POWER SAWS

Leon J. Lavis, 30 Elkin Ave., Heatherbrae, New South Wales, 2324, Australia

Filed Apr. 11, 1978, Ser. No. 895,479
Claims priority, application Australia, Apr. 12, 1977, PC9717
Int. Cl.[2] B27B *9/04*
U.S. Cl. 83—165 **11 Claims**



1. Mounting means for operably mounting a power saw upon a base support; wherein the power saw includes an assembly of a driving motor, a saw blade mounted on the motor shaft, guard means for the saw blade, and a base plate supporting the power saw assembly; said mounting means comprising: a power saw supporting cradle mounted upon a pedestal adapted to be secured to the base support, said cradle being rotatable in a horizontal plane and tiltable in a vertical plane on said pedestal; said cradle including slide bars supported upon the pedestal and projecting through opposite side of said pedestal, and clamps supported on the slide bars, said clamps being adapted to clamp the power saw base therebetween; one said slide bar being longer than the other whereby it has a limb extending beyond the pedestal a greater distance than the other slide bar on one side of said pedestal, both said slide bars projecting substantially the same distance on the opposite side of said pedestal depending upon the length of said base plate; one said clamp being mounted upon the limb and the other said clamp being fixed on the slide bars on said one side of the pedestal; whereby said power saw assembly when secured between the clamps in one position can be raised, lowered and traversed by the cradle across a work piece for performing a plurality of functions on said work piece; and whereby the power saw assembly can be moved through 180° to an inverted position relative to said work piece for performing an additional function on said work piece, by removing and inverting said cradle in said pedestal.

4,163,405

PAPER FEED CONTROL FOR AUTOMATIC PHOTOGRAPHIC PAPER CUTTER

Robert E. Diesch, Rogers, and Gerald R. Strunc, Maple Grove, both of Minn., assignors to Pako Corporation, Minneapolis, Minn.

Filed Sep. 29, 1977, Ser. No. 838,000
Int. Cl.[2] B26D *5/34, 7/06*
U.S. Cl. 83—371 **9 Claims**

1. A photographic paper cutter comprising:

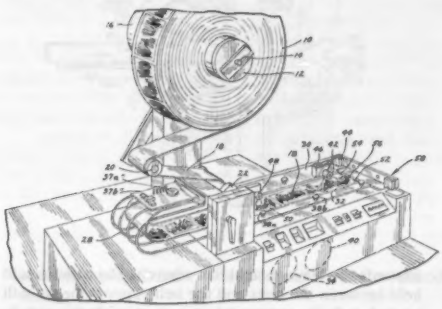
stepper motor means for advancing the photographic paper in steps;

knife means for cutting the photographic paper;

indicia sensing means for sensing indicia on the photographic paper indicative of desired locations of paper cuts and producing a cut signal when an indicium is sensed, the indicia sensing means being positioned in fixed relationship with respect to the knife means at a distance less than the shortest length of photographic paper to be cut;

means for producing a feed length signal indicative of the number of steps the photographic paper is advanced from one indicium to another indicium;

means for producing a signal indicative of the number of steps the paper is advanced between a desired location of a paper cut and an indicium;



feed-after-sense signal means for deriving a feed-after-sense signal from the feed length signal and the signal indicative of the number of steps the paper is advanced between a desired location of a paper cut and an indicium, wherein the feed-after-sense signal is a digital signal indicative of the number of steps the photographic paper must be advanced after a cut signal is received in order to align the desired location of paper cut associated with the sensed indicium with the knife means; and

means for controlling operation of the stepper motor means as a function of the feed-after-sense signal and the cut signal to cause the stepper motor means to advance the photographic paper until an indicium is sensed and then advance the paper an additional distance determined by the feed-after-sense signal.

4,163,406

CENTERING DEVICE FOR FEEDING ARTICLES TO A FOOD SLICER

Lynn D. Crawford, San Jose, Calif., assignor to Genevieve I. Hanscom and Genevieve I. Hanscom, Robert M. Magnuson, Lois J. Thomson, Trustees of the Estate of Roy M. Magnus, all of, Calif.

Filed Dec. 15, 1977, Ser. No. 860,865
Int. Cl.[2] B26D *7/06*
U.S. Cl. 83—424 **6 Claims**

1. A feed apparatus for use with a slicer having a plurality of power rotated blade assemblies mounted to converge on a common center line and segment articles fed along the center line at the infeed side of said blade assemblies, comprising in combination:

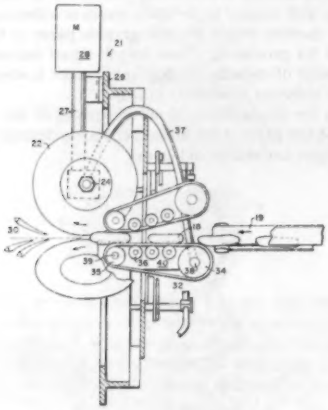
a plurality of feed belts held on spaced pulleys;

support means for each of said pulleys mounting each belt with an inward portion extending adjacent said center line at the infeed side of the blade assemblies and the remainder of each said belt extending radially outward therefrom;

a linkage assembly connecting said support means for moving each support means in unison substantially in a radially extending plane passing through said center line;

bias means for biasing said support means towards the center line; and

drive means including a flexible drive shaft connecting a power rotated blade assembly with a feed belt for rotating each belt about the supporting spaced pulleys in a direction to carry articles contacting the inward belt portion



towards the blade assemblies whereby the articles will be held between the belts and the belt support means will be moved radially outward by contact with the article to center the article on the center line of the blade assemblies

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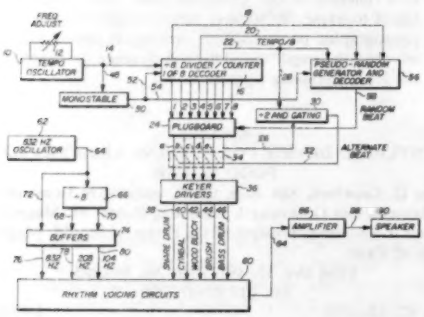
4,163,407

PROGRAMMABLE RHYTHM UNIT

Peter E. Solender, Williamsville, N.Y., assignor to The Wurlitzer Company, DeKalb, Ill.

Filed Jan. 17, 1977, Ser. No. 759,822
Int. Cl.[2] G10F *1/00*; G10H *1/02*
U.S. Cl. 84—1.03 **14 Claims**



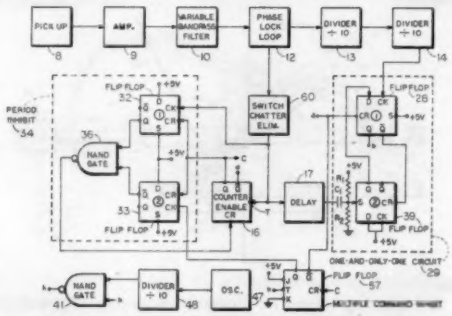
1. A programmable rhythm unit comprising: oscillator means for providing a continuous chain of pulses at a predetermined frequency, circuit means connected to said oscillator means for sequentially and repeatedly arranging said pulses in groups of an equal and predetermined number of pulses corresponding to repeating measures having an equal and predetermined number of beats per measure, said circuit means including a plurality of output lines for receiving said pulses to establish fixed beat positions in each measure, a plurality of rhythm voice input lines, a programmable array means for selectively transferring said pulse from selected ones of said output lines to selected ones of said plurality of rhythm voice input lines, pseudo-random pulse means connected to said circuit means and to said programmable array means for providing a random pulse at a predetermined beat position in each group corresponding to a random beat per measure, said programmable array means including means selectively to transfer said random beat to selected ones of said rhythm voice input lines, to establish a programmed rhythm pattern at said rhythm voice input lines, keyer driver circuit means connected to said rhythm voice input lines, audio signal generator means, and rhythm voicing circuit means connected to said keyer driver circuit means and to said audio signal generator means for simulating the audio output of a plurality of rhythm instruments in accordance with said programmed rhythm pattern.

4,163,408

MUSICAL TUNING DEVICE

Philip S. Capano, 2785 Sedgwick Ave., Bronx, N.Y. 10468, and David Capano, 79 Lake Ave., Saratoga Springs, N.Y. 12866

Filed Oct. 7, 1976, Ser. No. 730,754
Int. Cl.[2] G10G *7/02*
U.S. Cl. 84—454 **3 Claims**



1. A tuning device for use in tuning a musical instrument, comprising:

sensing means operable for sensing a first electrical signal having a certain frequency bandwidth and corresponding to an acoustical musical note produced by said musical instrument;

frequency decoding means coupled to said sensing means and operable for

(1) producing a second signal when said first signal lies within a predetermined frequency and amplitude detection range, and

(2) producing a third signal by transforming the said first signal into a digital pulse train having a period equal to the fundamental period of the said first signal;

synchronizing means coupled to said frequency decoding means and operable for producing, upon the random occurence of the said second signal and, by synchronization to the said third signal, a precise time gate signal equal in duration to a predetermined number of periods of the said third signal;

generating means, comprised of monolithic, semiconducting, read-only-memories (ROM's) and operable for producing a digital reference number representative of a selected musical note for tuning said musical instrument;

tuning tolerance means operable for converting a variable, user-selected potentiometer setting into a digital tolerance number representative of the limits, about perfect pitch, within which, the said first signal, after processing by the means herein claimed, is determined to be in tune;

digital processing means coupled to said generating means, said synchronizing means, and said tuning tolerance means and comprised of:

a digital pulse generator operable for producing pulse signals,

gating means coupled to said pulse generator and said synchronizing means and operable for producing a truncated pulse train by passing said pulse signals for the duration of the said time gate signal produced by said synchronizing means,

down/up counting means coupled to said gating means and

said generating means and operable for producing a residual digital count by causing each pulse of the pulse train produced by the said gating means to exhaustively decrement a down/up counter which has been pre-loaded to the said digital reference number of said generating means, with the condition that, should the counter decrement through zero, each subsequent, remaining pulse of the pulse train, now exhaustively increments the said counter,

magnitude comparing means coupled to said down/up counting means and said tuning tolerance means and operable for comparing the said residual digital count produced by said down/up counting means and the said digital tolerance number produced by said tuning tolerance means to produce

(1) an "in tune" signal whenever the said residual digital count is numerically less than, or equal to, the said digital tolerance number, or

(2) a "flat" signal whenever the said residual count is numerically greater than the said digital tolerance number and the said down/up counter has decremented through zero, or

(3) a "sharp" signal whenever the said residual digital count is numerically greater than the said digital tolerance number and the said down/up counter has not decremented through zero,

said digital processing means processing the said digital reference number by a counting action, under the control of the said time gate signal and, by numerical comparison with the said digital tolerance number, produces a one-of-three signal;

displaying means configured as three vertically aligned light emitting diodes (LED's), coupled to said digital processing means and operable to

(1) illuminate the center LED whenever the said digital processing means produces an "in tune" signal, or

(2) illuminate the lower LED whenever the said digital processing means produces a "flat" signal, or

(3) illuminate the upper LED whenever the said digital processing means produces a "sharp" signal;

monitoring means coupled to said frequency decoding means, said synchronizing means, and said displaying means and operable for producing, should the said second signal terminate prior to the completion of the said time gate signal,

(1) a fourth signal, and

(2) a blanking signal to, and causing, said displaying means to extinguish any illuminated LED;

initialization means coupled to said monitoring means, said tuning tolerance means, and said digital processing means and operable to initialize and "restart" these stated means whenever said monitoring means produces the said fourth signal.

4,163,409

OPTICAL METRONOMES

David O. Rumer, Jr., Rockford; Donald J. Findlay, Wheeling; Arthur E. Neumann, Winnetka, all of Ill., and Juan M. del Castillo, Risco No. 119, Mexico City, Mexico (20), assignors to Juan M. del Castillo, Mexico City, Mexico

Division of Ser. No. 722,283, Sep. 10, 1976, Pat. No. 4,082,029. This application Dec. 9, 1977, Ser. No. 859,501

Int. Cl.[2] G04F *5/02*

U.S. Cl. 84—484 **3 Claims**

1. An optical metronome for designating visually notes of music to be played, comprising:

display panel means for sequentially illuminating the notes to be played in relation to the timing designated for the musical notation,

a sheet of music with the musical notation thereon located for sequential illumination by said display panel means,

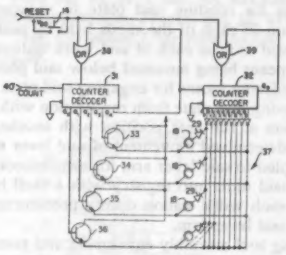
said display panel means including:

first and second counter decoder means,

said first counter decoder means having a plurality of output lines, one each of which is activated at a time, said output lines being sequentially activated by tempo or count pulses,

said first counter decoder means having control output line means activated by said tempo or count pulse in sequence after the last of a sequence of activated output lines of said first counter decoder means,

said second counter decoder means having a plurality of output lines, one each of which is activated at a time, and which are sequentially activated by an output from said control line means of said first counter decoder means, said second counter decoder means having control line means activated in sequence after the last of a sequence of



activated output lines of said second counter decoder means,

a matrix of light sources for illuminating said notes, each of said light sources having one terminal connected to one of said plurality of output lines of said first counter decoder means and another terminal connected to one of said plurality of output lines of said second counter decoder means, each of said light sources being activated when its associated output lines are simultaneously activated, and

OR gate means connected to said control lines to repeat the sequencing of the plurality of output lines of both said first and second counter decoder means.

4,163,410

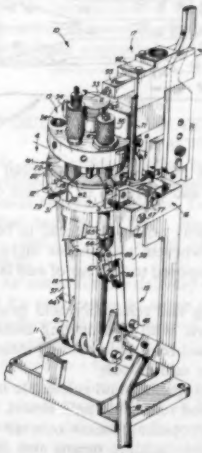
SHELL RELOADING MACHINE

Michael J. Dillon, 7021 E. Paradise Dr., Scottsdale, Ariz. 85254

Filed Nov. 7, 1977, Ser. No. 848,985

Int. Cl.[2] F42B *33/02*

U.S. Cl. 86—23 **7 Claims**



1. A shell reloading machine comprising in combination:

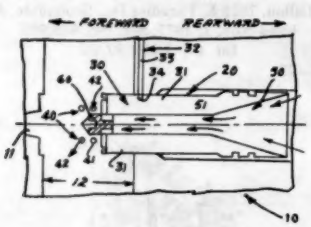
a table,

a shell registering plate revolubly mounted thereon and adapted to carry a plurality of shells,
a support mounted above said table and plate,
a plurality of tools mounted on said support one at each of a plurality of work stations for preparing and reloading shells depending from said plate and arranged in a circle so as to register with a plurality of shells held by said plate,
said tools sequentially comprising at each of said work stations a sizing die for reshaping the shells' outer walls and dislodging the spent primer from a primer cavity in the shell, a swaging tool assembly, primer insertion tool for inserting a new primer in the primer cavity of the shell, a powder dispenser and a bullet positioner and securing element,
lever means for rotating said plate to sequentially cause registration of each of the shells held by said plate with each of said tools at each of said work stations,
said lever means being mounted below said plate and comprising indexing means for engaging said plate for sequentially moving said plate from registration with one tool to registration at the next position with another tool with each predetermined movement of said lever means,
means coupled to said lever arm for simultaneously moving each of said tools into registry with a shell held by said plate at each work station during predetermined movement of said lever arm,
said swaging tool assembly enveloping and pressing downwardly against the associated shell when moved into registry therewith, and
a ram coupled to and actuated by said lever arm for moving into the primer cavity of the shell enveloped by said swaging tool assembly in a direction opposite to the movement of said swaging tool assembly for removing any of its crimped edges.

4,163,411
BREECH CLOSURE MECHANISM

Robert N. Teng, Huntington Beach, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 29, 1977, Ser. No. 865,467
Int. Cl.[2] F41F *1/00*
U.S. Cl. 89—1 H **6 Claims**

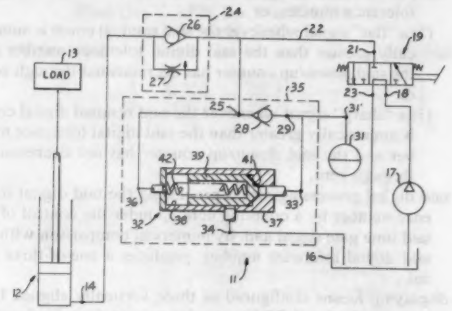


1. A breech closure mechanism for a model launcher gun having a launch tube and a breech to the rear of said launch tube, comprising:
a. means for releasably holding a model to be launched by firing said gun, wherein said means includes a slidably movable collar disposed to the rear of said launch tube and in said breech;
b. means for heating said releasably held model to a preselected temperature, with said heating means operatively associated with said releasable holding means and removably positioned in said breech;
c. and, means for propelling said releasable holding means, and said heated and releasably held model, to said launch tube, with said propelling means operatively associated with said releasable holding means and disposed to the rear of said slidably movable collar of said releasable holding means;
whereby said breech is closed, and whereby said heated model is inserted into said launch tube and is released therein by said releasable holding means, and also whereby said gun is then fired, thereby launching said heated model without any significant cooling thereof.

4,163,412
FLUID CYLINDER CONTROL WITH PRECISION STOP ACTION

Ralph D. Porter, Euclid, Ohio, assignor to Towmotor Corporation, Mentor, Ohio

Filed Oct. 3, 1977, Ser. No. 839,053
Int. Cl.[2] F15B *13/042*
U.S. Cl. 91—451 **6 Claims**



1. A control system for a fluid-operated device comprising:
a fluid reservoir and a pump for pressurizing fluid therefrom,
means forming a pressurized fluid supply passage for supplying fluid to a fluid operated device,
a control valve having an inlet communicated with said pump and having an outlet communicated with said supply passage and having a drain port communicated with said reservoir, said control valve having at least one open position for transmitting pressurized fluid from said pump to said supply passage and at least one position for transmitting fluid from said supply passage to said drain port, and having at least one closed position at which said supply passage is blocked,
an accumulator, and
accumulator control means having first means for communicating said supply passage with said accumulator when the pressure in said supply passage exceeds the pressure in said accumulator and for isolating said accumulator from said supply passage while second means relieves excess accumulator pressure to said reservoir during reversed relative pressure conditions, said first and second means each being responsive to pressure differentials between said supply passage and said accumulator.

4,163,413
VEHICLE CONTROL SYSTEM

Robert B. Kennicutt, Morton, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

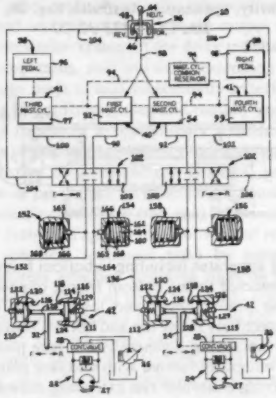
Filed Feb. 9, 1978, Ser. No. 878,123
Int. Cl.[2] F15B *13/06, 13/09*
U.S. Cl. 91—521 **20 Claims**

1. A vehicle control system for controlling first and second drive transmission assemblies each having a control element for selectively controlling forward and reverse operation of a respective transmission assembly, each of said control elements being associated with a respective control valve, the control system comprising:
slave cylinder means for individually moving said control elements;

master cylinder means for controlling operation of said slave cylinder means;

first control means for selectively controlling said control elements through said master cylinder means and operating said transmission assemblies at substantially the same speed and direction; and

second control means for controllably altering the controlling of at least one of said control elements by said first control means.

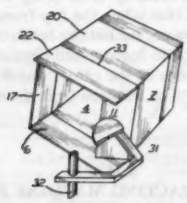


4,163,414

METHOD OF ERECTING FLAT FOLDED CASES

Joseph L. Bachman, Jr.; George E. Ginther, Sr., both of King of Prussia, and A. David Johnson, Jr., Radnor, all of Pa., assignors to Wayne Automation Corp., Bridgeport, Pa.

Filed Feb. 23, 1977, Ser. No. 771,166
Int. Cl.[2] B31B *1/76*
U.S. Cl. 93—53 M **5 Claims**



1. In a method of erecting a flat folded case one face of which has a first side panel including a bottom outside flap and a second adjacent side panel including a bottom inside flap and the opposite face of which has a third side panel including a bottom inside flap and a fourth side panel including a bottom outside flap, the steps of:

orienting said case with the plane of the case extending substantially vertically in a take-down plane and with the first side panel and its bottom outside flap being disposed above the second side panel and its bottom inside flap and with the score line between the first and second side panels extending substantially horizontally;

moving said first side panel and its bottom outside flap from said vertical orientation downwardly in an arc so the first side panel is in a horizontal orientation and performing said motion so that the score line moves down along an arc of a circle and at the same time causing the second side panel and its bottom inside flap to rotate about said score line toward the first panel so that the second side panel and flap extend at an obtuse angle to the first side panel when the same is in said horizontal orientation whereby the case is partially erected; and

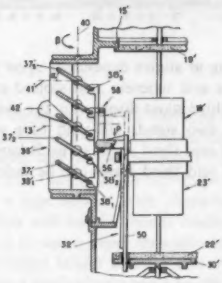
while the panels are in said obtuse orientation, holding said first side panel relatively fixed while permitting the other panels to relatively move and causing said obutse angles to decrease respectively to substantially 90° whereby the case is fully erected.

4,163,415

VENTILATION DEVICE

Rene E. Neveux, Les Clayes-sous-Bois, France, assignor to Societe Anonyme Francaise du Ferodo, France

Filed Jul. 11, 1977, Ser. No. 814,630
Claims priority, application France, Jul. 12, 1976, 76 21342
Int. Cl.[2] B60H *1/00*; F24F *13/04*
U.S. Cl. 98—2.09 **13 Claims**



5. An air ventilation device comprising:

a feed for introducing warm air;

a feed for introducing fresh air;

movable air distribution means for distributing the air coming from said feeds in a direction which depends from the position of said movable air distribution means;

first means for controlling said feeds to said air distribution means; and

transmission means for connecting said first means to said air distribution means such that when said first means is in a first position corresponding to the introduction of warm air, said air distribution means is locked into a single position and cannot be displaced significantly and when said first means is in a position different from the first, corresponding to the introduction of fresh air, said air distribution means is free to move in at least one direction and is adapted to be hand controlled.

4,163,416

SLOTTED OUTLET FOR THE VENTILATION OF INTERIOR SPACES

Hermann Kurrle, and Gottfried Müller, both of Kolbingen, Fed. Rep. of Germany, assignors to Schako Metallwarenfabrik Ferdinand Schad GmbH, Kolbingen, Fed. Rep. of Germany

Filed Aug. 29, 1977, Ser. No. 828,867
Int. Cl.[2] F24F *13/06, 13/08*
U.S. Cl. 98—40 R **12 Claims**

1. A slotted air outlet for the delivery of air into an interior space, adapted for connection to an air delivery passage, and mounted in a surface having an opening defined by the outlet comprising, in combination:

a face plate hinged to a frame,

at least one elongated slot-type opening on said face plate,

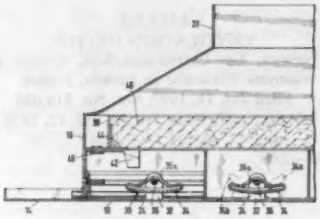
at least two stands fastened to said face plate on its side closest to the air delivery passage oriented parallel with each other and disposed at opposed extremities of said slot-type opening along the elongated extent thereof,

a shaft supported on and extending between said stands,

a tube surrounding said shaft, and a lamina fastened to said

tube said lamina being wider than the width of said slot type opening;

whereby when said lamina is rotated, said tube rotates therewith and the lamina is held by friction between said tube and said shaft and said lamina causes air received from the air delivery passageway to be redirected through said



slotted opening at angles dependent upon the orientation of said lamina and wherein said slotted opening is provided with a third stand disposed in the same sense as and between said two stands and said tube and lamina are interrupted at said third stand so each lamina portion on either side of said third stand can be independently oriented.

4,163,417

MASH AND WORT TUB

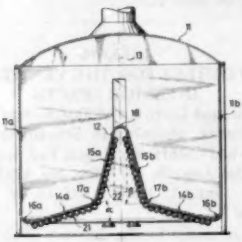
Alfons Wolfseder, Freising, Fed. Rep. of Germany, assignor to Anton Steinecker Maschinenfabrik GmbH, Freising, Fed. Rep. of Germany

Filed Jul. 22, 1977, Ser. No. 818,148

Claims priority, application Fed. Rep. of Germany, Jul. 23, 1976, 2633281; Jun. 7, 1977, 2725758

Int. Cl.[2] C12H *1/00*

U.S. Cl. 99—277.2 **11 Claims**



1. A mash and wort tub of approximately rectangular shape comprising a bottom wall and four approximately upright side walls, said bottom wall being inclined upwardly from adjacent opposite ones of the side walls toward the central portion of said tub, with the angle of incline increased at the central portion of said tub, and heating means for heating the inclined bottom wall from below said inclined bottom wall, whereby a spouting type boiling action is created in the liquid contained in the tub.

4,163,418

COOKING APPARATUS

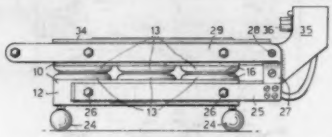
Keith Thelander, Manly West, Australia, assignor to Multimould Enterprises Pty. Ltd., Wynnum Central, Australia

Filed Sep. 26, 1977, Ser. No. 836,772

Claims priority, application Australia, Sep. 26, 1976, 7506/76

Int. Cl.[2] A47J *37/00*

U.S. Cl. 99—374 **5 Claims**



1. Cooking apparatus including: a bottom frame, a top frame hingedly connected to the bottom frame, oppositely arranged but otherwise similar upper and lower metal cooking units mounted respectively in the top and bottom frames, each of the cooking units including a generally flat face plate and a series of hot plates integrally formed with said face plate, each of said hot plates having a circular rim extending outwardly from the face plate, a concavity within the rim in which the food to be cooked is positioned, and a circular cutting bead at the outer edge of the rim, electrical heating means for simultaneously heating the face plates and series of hot plates of both cooking units, said electrical heating means including electrical heating elements mounted in contact with the surface of each cooking unit face plate remote from the hot plates of the unit, said heating elements being confined in locating ribs formed integrally with and extending downwardly from said surfaces of said plates, the thickness of said face plate in the regions thereof surrounding said hot plates being approximately one-half the thickness of said face plate in the region of said integrally formed hot plates, the positioning of said heating elements and the integral formation of said hot plates and said face plate creating residual heat in said hot plates between cooking sequences thereby ensuring the production of cooked products at a rapid rate, said cooking units being so constructed and hingedly connected that when the top frame is lowered relative to the bottom frame, the cutting beads of the hot plates of the one are brought into register and contact with the cutting beads of the hot plates of the other, thereby permitting protruding excess food to be trimmed from the edges of the superimposed hot plates.

4,163,419

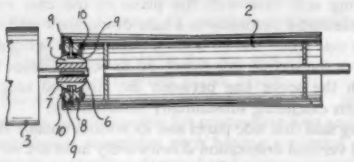
ROTARY COMPACTING MACHINE FOR FIBROUS MATERIAL

Joseph Molitorisz, 624 81st Ave. NE., Bellevue, Wash. 98004

Filed Jul. 17, 1978, Ser. No. 919,922

Int. Cl.[2] B30B *3/04*

U.S. Cl. 100—89 **1 Claim**



1. A rolling-compressing apparatus for forming loose fibrous material into continuous dense cylindrical core which is cut into individual rolls of desired length, comprising; a core forming channel, said core forming channel being confined by and having a plurality of circumferentially arranged compression

rollers, each of said compression rollers receiving power drive and simultaneous radial and axial support at its drive end from a yoke mechanism, said yoke mechanism consisting of; a substantially spherical sectioned yoke having two inwardly extending and radially opposite passage ways in the entire axial length of the yoke, said substantially spherical sectioned yoke being keyed and securely mounted on the output drive shaft of the power transmission system of the drive train of said rolling-compressing apparatus, said inwardly extending and radially opposite passage ways of said substantially spherical sectioned yoke receiving inwardly extended and radially opposite pins or pin supported rollers of a substantially cylindrical ring, the inside opening of said substantially cylindrical ring being slideably received over the substantially spherical section of said yoke, said pins or pin supported rollers being securely attached to said substantially cylindrical ring, said substantially cylindrical ring being restricted against axial movement relative to said substantially spherical sectioned yoke by properly dimensioned and securely attached retaining rings on both sides of said substantially cylindrical ring, the inside opening of said retaining rings being slideably received over the substantially spherical section of said yoke, said substantially cylindrical ring being securely attached to the drive end of said compression rollers of said rolling-compressing apparatus.

4,163,420

COMPACTOR ARRANGEMENT

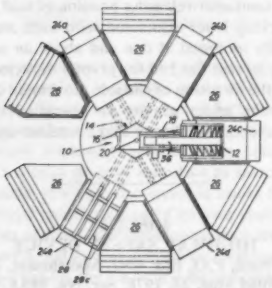
Geoffrey Sercombe, Ruislip, England, assignor to G. S. Compactors Limited, Middlesex, England

Filed Jun. 17, 1977, Ser. No. 807,518

Claims priority, application United Kingdom, Jun. 23, 1976, 26158/76

Int. Cl.[2] B30B *7/00*

U.S. Cl. 100—223 **7 Claims**



1. A compactor arrangement comprising: a platen support, a pressure platen mounted on said platen support for lowering and raising movement into and out of a skip, a skip support for supporting a plurality of skips and locating the skips for reception of said platen, one of said supports being movable relative to the other said support for aligning each skip with said pressure platen to compact material in each skip, platen drive means for moving said platen in compacting strokes for compacting material in each skip which is aligned with said platen, said supports being separate and being mounted independently of one another, and cooperating means between said supports for preventing said platen support from being lifted due to forces applied during compaction of material in a skip by said platen.

4,163,421

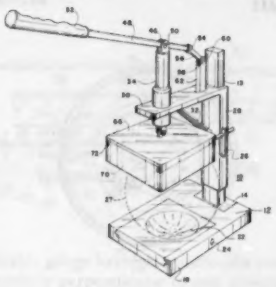
MARKER FOR ROUND OR FLAT OBJECTS

Charan J. S. Sihota, 822 Oregon St., Bakersfield, Calif. 93305

Filed Sep. 12, 1977, Ser. No. 832,801

Int. Cl.[2] B41F *17/00*

U.S. Cl. 101—41 **2 Claims**



1. A marker for round and flat surfaced objects comprising a support including an object holder slidably and reversibly mounted thereon; said holder having a flat object-receiving surface on one side thereof and a cup-shaped receiving surface on the other; a type holder with character printing indicia mounted thereon and handle means resiliently connected to said type holder to move same vertically into contact with an object on said object holder to mark said object, wherein said support includes a vertical arm and a height adjustable sleeved bracket mounted thereon; said bracket having a horizontally extending arm, with lever means being pivoted on said arm and connected to said handle.

4,163,422

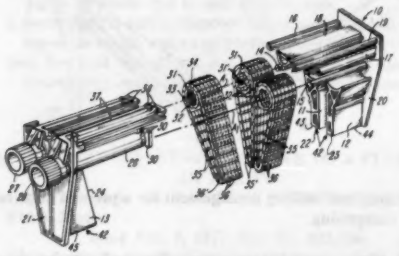
PRINT HEAD

Paul H. Hamisch, Jr., Franklin, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Filed Sep. 12, 1977, Ser. No. 832,248

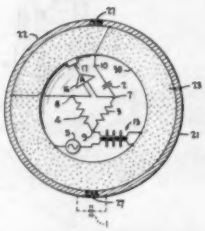
Int. Cl.[2] B41J *1/20*

U.S. Cl. 101—111 **9 Claims**



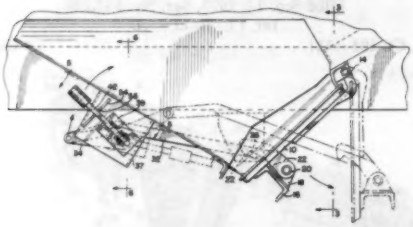
1. A compact print head, comprising: a plurality of coaxially mounted wheels, a support having a plurality of supporting stations, and a plurality of printing bands, each printing band having a plurality of different printing elements, each printing band being trained about a wheel and the support and at least some of the printing elements being selectively registerable with any one of the supporting stations, the printing elements lying in the same plane irrespective of the supporting station with which they are registered, whereby the print head can print at least two lines of data.

4,163,423
PROXIMITY FUZE
Hans W. Kohler, Washington, D.C., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Apr. 18, 1962, Ser. No. 189,250
Int. Cl.[2] F42C *13/00*
U.S. Cl. 102—211 11 Claims



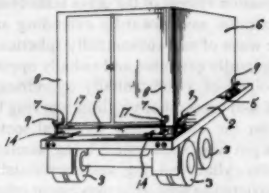
4. In a projectile comprising a casing having a first electrically conducting part, a second electrically conducting part and an electrically insulating part interposed between said first and second conducting part, a proximity detector comprising:
(a) a bridge circuit;
(b) said bridge circuit having a first terminal connected to said first electrically conducting part of said projectile casing; and
(c) said bridge circuit having a second terminal adjacent to said first terminal and connected to said second electrically conducting part of said projectile casing.

4,163,424
HOPPER DOOR LOCKING AND ACTUATING MECHANISM
Thomas Lindauer, Schererville, Ind., assignor to Pullman Inc., Chicago, Ill.
Filed Sep. 6, 1977, Ser. No. 830,939
Int. Cl.[2] B61D *7/02, 7/18, 7/26, 49/00*
U.S. Cl. 105—313 17 Claims



1. A closing and locking arrangement for a pivoted door on a hopper comprising
a shaft,
bearing means rotatably mounting the shaft on the door spaced from the door pivot,
an elongated hook member having one end fixedly secured to the shaft and having a hook formed in the other end of the hook member,
a locking lug fixed relative to the hopper for cooperating with the hook on the hook member to secure the door closed,
an operating link directly, fixedly secured to the shaft, and
crank means including an arm eccentrically pivoted to the other end of the operating link for pivoting the link to release and engage the hook with the locking lug and for pivoting the door between open and closed positions.

4,163,425
LOAD ANCHORING SYSTEMS FOR FLATBED
Victor Bédard, 40 Van Vliet St., Lacolle, Canada (J0J 1J0)
Filed Oct. 31, 1977, Ser. No. 847,218
Int. Cl.[2] B61D *17/00, 45/00*
U.S. Cl. 105—366 C 6 Claims



1. A system for anchoring an elongated container in transport position longitudinally of a flat bed vehicle, said container being of the type having a recess, or aperture, made in the lower end of each corner thereof and opening at the end faces of said container, said system comprising beams secured to said flat bed transversely thereof and spaced apart longitudinally of said flat bed a distance substantially equal to the length of said container for supporting said container off said flat bed at the four corners thereof, means to positively locate the four corners of said container in vertical register with the outer ends of said beams, a slideway carried by said beams at each outer end thereof, each slideway extending through and transversely of the associated beam and being substantially parallel to the flat bed of the vehicle, an anchor member for each slideway, said anchor member having a slide portion slidable along the associated slideway for slidable movement in a direction substantially parallel to said flat bed and towards and away from the corresponding end face of said container between a container-anchoring position and a container-releasing position, respectively, a prong carried by said anchor member and facing said container end face and engaging said recess in said container-anchoring position of said anchor member and clearing said recess in said container-releasing position of said anchor member, and a locking lever associated with each anchor member freely pivotally mounted at one end about an axis extending longitudinally of said flat bed for pivotal movement in a plane transverse to the direction of slidable movement of said anchor member, to take under gravity an operative limit position, locking said anchor member in said container-anchoring position.

4,163,426
HIGHWAY SAFETY DEVICE
Donald C. O'Neill, P.O. Box 4092, Manchester, N.H. 03108
Filed Mar. 23, 1978, Ser. No. 889,871
Int. Cl.[2] B60Q *1/32;* G09F *7/00*
U.S. Cl. 116—28 R 2 Claims

1. A highway safety device for use in signaling for assistance in the event of a breakdown on the highway comprising: a unit adapted to be supported on the raised side window glass of a motor vehicle, said unit having a front section, a spacer section and a spaced pair of resilient legs extending downwardly from the spacer section, prior to engagement with the window said legs having their lower ends in engagement with one side of the front section, a pole extending outwardly and upwardly from the lower portion of the other side of the front section, said unit being mounted on the car window with the front section pressed against one surface of the window and the pair of legs in spring pressed engagement with the other side of the window, the spacer being in engagement with the top edge of the window, said pole having a luminous flag movably

mounted within the pole and a light on the top for signaling passing vehicles, said flag provided with diagonally extended

stiffening seams and a laterally extended stiffening member for holding the flag in an outwardly extended position to the pole.

4,163,427

FREEZE-THAW INDICATOR APPARATUS

Isadore Cooperman, and Morton Salkind, both of 62 Farms Rd., Freehold, N.J. 07728

Filed Dec. 5, 1977, Ser. No. 857,299
Int. Cl.[2] G01K *11/06*
U.S. Cl. 116—217 **15 Claims**

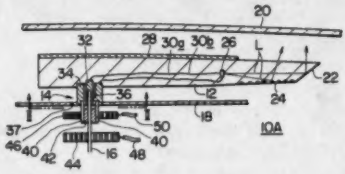
1. Freeze-thaw indicator apparatus comprising a plurality of frangible microcapsules, individual ones of which enclose water soluble dye formers mixed in dry form and individual others of which enclose colorless water in liquid form, said dye former and water enclosing microcapsules being securedly positioned on a indicia support such that as surrounding temperatures decrease to freeze the water in liquid form, the ice which is produced causes rupture of its own enclosing microcapsule and that of dye former enclosing microcapsules adjacent to it, and such that as surrounding temperatures thereafter increase above freezing, the ice which melts flows through the ruptures in said water enclosing and adjacent dye former enclosing microcapsules to solubilize the dye formers in dry form to provide a colored dye and a visual indication thereof, with selected ones of said water enclosing microcapsules and selected ones of said dye former enclosing microcapsules being predeterminedly positioned proximate each other and sized of predetermined different construction so as to exhibit a predetermined degree of responsiveness to decreases and increases in surrounding temperature in providing said colored dye and said visual indications, and with said selected water enclosing and dye former enclosing frangible microcapsules providing said visual indications on said support representative of the surrounding temperature to which all of said water enclosing and dye former enclosing frangible microcapsules are subjected and the length of time to which all of said frangible microcapsules are kept at said temperature.

4,163,428

INDICATOR GAUGE WITH ILLUMINATED POINTER

Masao Ishikawa, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Aug. 14, 1978, Ser. No. 933,618
Claims priority, application Japan, Sep. 9, 1977, 52/107969
Int. Cl.[2] G09F *9/00*
U.S. Cl. 116—288 **8 Claims**



1. An indicator gauge having a spindle of a movement, a dial board substantially perpendicular to said spindle, and a viewing in front of said dial board, said indicator gauge comprising:
- an indicator pointer of a transparent material arranged between said dial board and said viewing window, said pointer being formed with first and second surfaces which respectively face said dial board and said viewing window, said first surface being matted;
- illuminating means disposed in said pointer for emitting light rays when electrically energized;
- a first conductive cylindrical member mounted on an end of said spindle;
- a second conductive cylindrical member coaxially and spacedly disposed around said first conductive member to form therebetween a tubular clearance, said first and second conductive cylindrical members being individually and electrically connected to said illuminating means;
- a tubular insulating member tightly disposed in said tubular clearance, a unit of said first and second conductive cylindrical members and said insulating member being forcedly disposed in a blind bore formed in said pointer;
- a plurality of conductive pins having respective enlarged head portions which are forcedly disposed in a circular groove formed in an exposed end of said second conductive cylindrical member;
- a tubular insulating member disposed about said spindle to put on the cylindrical surface thereof said pins;
- a first spiral spring disposed about said spindle and connecting at its inside end to said spindle; and
- a second spiral spring disposed about said pins and connecting at its inside end to at least one of said pins,

said first and second spiral springs being individually and electrically connected to an electrical power source.

4,163,429

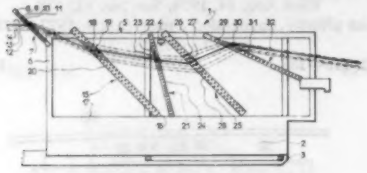
DEVICE FOR APPLYING ADHESIVE TO A PLURALITY OF STRIPS

Georges Sireix, 9, rue Saint-Marc, 68400 Riedisheim (Haut-Rhin), France

Filed Aug. 5, 1977, Ser. No. 822,330
Claims priority, application France, Nov. 10, 1976, 76 34816
Int. Cl.[2] B32B *31/08, 31/12*
U.S. Cl. 118—117 **10 Claims**

1. Apparatus for applying fluid adhesive to a plurality of strips to be wound helically to form tubular wrappings, said apparatus comprising a tank containing fluid adhesive, means for guiding said strips longitudinally over said tank wholly above said adhesive with said strips arranged in stair step fashion transversely of said tank with successive strips laterally and vertically offset from one another but partially overlapping so that an edge of an upper strip is disposed over the next lower strip, means for delivering fluid adhesive from said tank onto the uppermost of said strips, and a horizontal scraper

extending transversely of each strip downstream of said fluid delivering means in position to spread said adhesive laterally of each strip and to cause surplus adhesive to flow off side edges



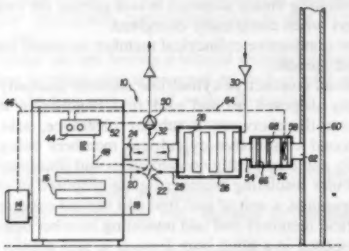
of said strip, whereby surplus adhesive from an upper strip flows onto the next lower strip and any remaining surplus adhesive flows back to said tank.

4,163,430

HEAT RECOVERY AND FILTER SYSTEM AND PROCESS FOR FURNACE EXHAUST GASES

Siegmar R. Neumann, Julius-Leber-Str. 10, 8070 Ingolstadt, Fed. Rep. of Germany

Filed Feb. 8, 1978, Ser. No. 876,144
Int. Cl.[2] F22B *33/00*
U.S. Cl. 122—20 B **10 Claims**



1. Heating system apparatus in combination with means for heating a fluid medium by combustible material, said apparatus comprising:

means for supplying said fluid medium from said heating means to an installation to be heated, and for returning said fluid medium from said installation to said heating means;

heat exchange means operatively connected to said heating means and said fluid medium return means for recovering the thermal energy within the exhaust gases of said combustible materials and transferring said thermal energy to said fluid medium so as to pre-heat said fluid medium prior to the introduction of said fluid medium into said supply means;

filter means interposed between said heat exchange means and an atmospheric exhaust means of said installation for filtering said cooled exhaust gases prior to the discharge of said exhaust gases into the atmospher, said filter means comprising fan means for drawing said exhaust gases through said filter means and for discharging said exhuast gases into said atmospheric exhaust means; and

means for energizing said fan means simultaneously with the energization of said heating means so as to remove said exhaust gases from the system as said exhaust gases are generated, and for de-energizing said fan means subsequent to the de-energization of said heating means so as to insure the removal of all exhaust gases from said system.

8. In a process of heating an installation wherien a heated fluid medium produced by burning a combustible material is conducted through said installation so as to heat said installation, said process comprising:

returning said fluid medium for additional heating by said burning combustible material;

conducting said returning fluid medium through a heat exchange relationship with the gases produced from said burned combustible materials so as to recover the thermal energy from said gases and to transfer said recovered thermal energy to said fluid medium for pre-heating said fluid medium prior to said additional heating there; and simultaneously

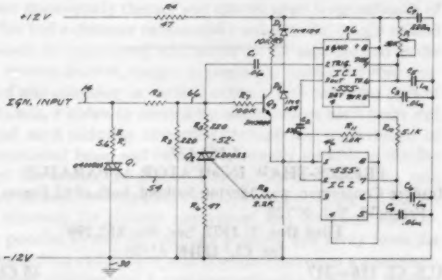
increasing the up-draft of said cooled gases in a heat-exchange relationship with said fluid medium thereby resulting in the exhausting of said substantially cooled gases into the atmosphere.

4,163,431

ZERO-HYSTERESIS ENGINE RPM LIMITER

Richard L. Wilkinson, Torrance, Calif., assignor to Race Research, Inc., Carson, Calif.

Filed Jan. 17, 1977, Ser. No. 759,740
Int. Cl.[2] F02P *9/00*
U.S. Cl. 123—118 **2 Claims**



1. In an ignition system for an internal combustion system having an ignition coil with primary and secondary windings and a breaker switch connected in the series circuit with the primary winding and a power source, the periodic opening of the breaker switch being synchronous with the speed of the engine and the time period between openings being directly proportional to the rotational speed of the engine, there being an ignition pulse produced across the breaker switch when opened, apparatus for limiting the rotational speed of the engine to a predetermined rate, comprising:

a voltage dividing network with an output tap connected across said breaker switch,

first digital timer means connected to said breaker switch and responsive to said ignition pulse to produce a first time signal during a first time period;

a potentiometer connected to said first digital timer means to allow adjustment of the duration of said first time signal,

bidirectional trigger means connected to said output tap of said voltage dividing network including a direct connection and a parallel pulse polarity inverting means connected to said first digital timer means;

second digital timer means connected to said first timer means and responsive to the end of said first time signal to produce a second time signal for a second time period of fixed duration;

first bidirectional controlled switch means connnected to said output tap of said voltage dividing network in series with an impedance across said breaker switch, said switch having a gate terminal; and

second bidirectional switch means connected in series circuit with a gate resistor across said breaker switch and having a gate terminal connected to receive said second time signal of said second digital timer means, the junction of said gate resistor and said second bidirectional switch

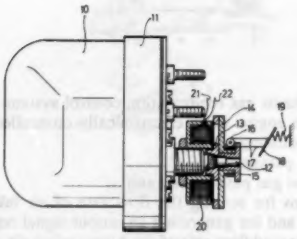
means being connected to said gate terminal of said first bidirectional switch means, whereby said second bidirectional switch means serves as a delay means to change the waveform of said ignition pulse when said first bidirectional switch means is conducting.

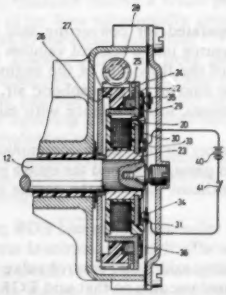
4,163,432

ELECTRICALLY MOTOR DRIVEN AND DECLUTCHABLE POSITIONING DEVICE FOR A MECHANICAL CONTROL

Wilhelm Hertfelder, Steinenbronn, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 8, 1977, Ser. No. 822,522
Claims priority, application Fed. Rep. of Germany, Aug. 18, 1976, 2637122
Int. Cl.[2] F02N *17/00*
U.S. Cl. 123—102 7 Claims





1. An electrically motor-driven positioning device for the accelerator lever of an internal combustion engine for use in a vehicle speed servo control sysem, comprising in combination:

a reversible electric motor having a motor shaft; first reduction gearing (10) connected to said motor shaft for operation by said electric motor and having an output drive shaft (12);

an electromechanically engageable and releasable clutch coupling having a first member constituted by clutch disk (24) affixed to said output drive shaft (12) of said first reduction gearing (10), a second member (27) in mechanically operative connection, through a second reduction gearing (28), with said accelerator lever (18), and spring means (29) for urging said second member away from first member, said mechanically operative connection being capable of positioning said accelerator pedal independently of the other forces so long as said clutch coupling is engaged;

an electromagnet (20) for pressing said second coupling member (27) into force-transmitting engagement with said first coupling member (24) against the force of said spring (29) when said electromagnet is energized, and

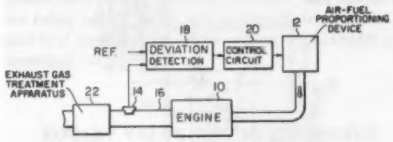
mechanical position restoring means for automatically restoring said mechanical control to a predetermined rest position when said coupling is released.

4,163,433

AIR/FUEL RATIO CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE HAVING COMPENSATION MEANS FOR VARIATION IN OUTPUT CHARACTERISTIC OF EXHAUST SENSOR

Takeshi Fujishiro, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Japan

Filed Dec. 22, 1976, Ser. No. 753,177
Claims priority, application Japan, Dec. 27, 1975, 50/155771
Int. Cl.[2] F02B *3/00*
U.S. Cl. 123—119 EC 10 Claims



1. A control system for maintaining the air-to-fuel ratio of a combustible mixture fed to an internal combustion engine at a preset ratio, the system comprising:

an electrically controllable air-fuel proportioning device;

an oxygen sensor of the concentration cell type having a layer of a solid electrolyte installed in an exhaust line of the engine to produce an electrical first signal representing the concentration of oxygen in the exhaust gas as an indication of a realized air-to-fuel ratio, said first signal standing at a first voltage level while the realized air-to-fuel ratio is below a stoichiometric air-to-fuel ratio but at a second voltage level lower than said first voltage level while the realized air-to-fuel ratio is above the stoichiometric ratio, a time-voltage gradient of a transition of said first signal from one of said first and second voltage levels to the other varying in dependence on the temperature and flow velocity of the exhaust gas at a section of the exhaust line where said oxygen sensor is installed, said gradient becoming less steep as at least one of the temperature and flow velocity of the exhaust gas lowers particularly when the transition proceeds from said first voltage level to said second voltage level;

a deviation detection circuit for producing a second signal representing a deviation of said first signal from a reference signal; and

a control circuit for producing a control signal to control the function of said air-fuel proportioning device based on said second signal, said control circuit including:

a compensation means for varying the relation between said second signal and said control signal while at least one of the temperature and flow velocity of the exhaust gas is each below a predetermined level in such a manner that an air-to-fuel ratio implied by said control signal as a superficial target of the air-to-fuel ratio control is shifted from said preset ratio to a provisional ratio which is below said preset ratio, the difference between said preset ratio and said provisional ratio being determined so as to compensate for less steepening of said time-voltage gradient; and

an integrator for producing said control signal based on an integration of said second signal, said compensation means

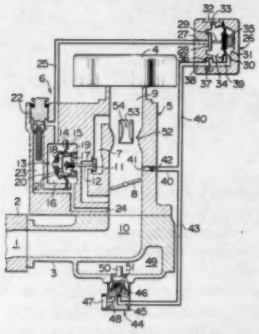
accomplishing the superficial shift of the aim of the control by varying the time constant for the integration.

4,163,434

AIR-FUEL RATIO REGULATOR FOR INTERNAL COMBUSTION ENGINE

Yutaka Tsukamoto, and Bonnosuke Takamiya, both of Joyo, Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Japan

Filed Jun. 21, 1977, Ser. No. 808,553
Claims priority, application Japan, Mar. 4, 1977, 52-24023
Int. Cl.² F02M *23/04*
U.S. Cl. 123—119 D **8 Claims**



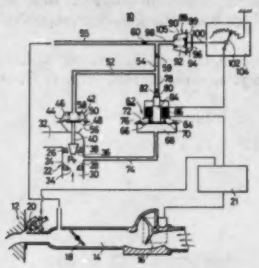
1. An air-fuel ratio regulator for an internal combustion engine comprising a carburetor having an air passage comprising an air inlet, venturi, a throttle valve downstream of said venturi and an intake passage downstream of said throttle valve, a by-pass air passage leading from said air inlet to said intake passage, first control valve means in said by-pass air passage for opening and closing same, said control valve means comprising a valve member movable between an open position and a closed position, a valve stem for moving said valve member, spring means acting on said valve member to bias it to closed position, a differential pressure responsive means comprising a diaphragm disposed to act on said valve stem to move said valve member to open position, a first vacuum chamber on one side of said diaphragm, a second vacuum chamber on the opposite side of said diaphragm, said vacuum chambers being so disposed that said diaphragm is moved in a direction to open said valve means when pressure in said second vacuum chamber is higher than pressure in said first vacuum chamber, first passage means connecting said first vacuum chamber directly with said intake passage, second passage means comprising a restricted orifice and a check valve connected in parallel with one another connecting said second vacuum chamber with said intake passage, said check valve being disposed to permit flow only from said first vacuum chamber to said second vacuum chamber, third passage means leading from said second vacuum chamber to the atmosphere and second control valve means in said third passage means, said second control valve means being responsive to specific operating conditions of the engine to apply atmospheric air pressure to said second vacuum chamber.

4,163,435

EXHAUST GAS RECIRCULATION CONTROL SYSTEM

Yasuo Nakajima, Yokosuka; Hiroshi Kuroda, Tokyo, and Yoshimasa Hayashi, Yokohama, all of Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Sep. 6, 1977, Ser. No. 830,865
Claims priority, application Japan, Sep. 7, 1976, 51/107085; Sep. 7, 1976, 51/107086
Int. Cl.² F02M *25/06*
U.S. Cl. 123—119 A **15 Claims**



1. An exhaust gas recirculation control system in combination with an engine of an electronically controlled fuel injection type including

an intake passageway,

an exhaust gas passageway and

first means for sensing the flow rate of air taken into the engine and for generating an output signal representative of the sensed flow rate of the engine taken air, said exhaust gas recirculation (EGR) control system comprising

passage means communicating with a vacuum source for receiving a vacuum therefrom and with the atmosphere for receiving atmospheric air therefrom,

electric means electrically connected to said first means for receiving said output signal therefrom and for generating an electromagnetic force corresponding to said output signal,

second means operated for converting said vacuum from said vacuum source into a control vacuum representative of a function of the flow rate of the engine taken air by controlling the amount of atmospheric air, admitted into said passage means, in accordance with said electromagnetic force,

an EGR passageway for providing communication between the exhaust gas passageway and the intake passageway for recirculating exhaust gases of the engine into the intake passageway,

an EGR control valve disposed in said EGR passageway for controlling the effective cross sectional area thereof, and

means for operating said EGR control valve in accordance with said control vacuum so that said EGR control valve increases and reduces the effective cross sectional area of said EGR passageway in accordance with increase and decrease in the flow rate of the engine taken air, respectively.

4,163,436

GASOLINE MISER

Albert Fugett, Rte. 2, Box 221, Gaston, Ind. 47342

Filed May 25, 1977, Ser. No. 800,188
Int. Cl.² F02M *29/00*
U.S. Cl. 123—141 **9 Claims**

1. A gasoline miser for use between the carburetor and the intake manifold of a gasoline engine, said gasoline miser comprising:

a substantially hollow top section;

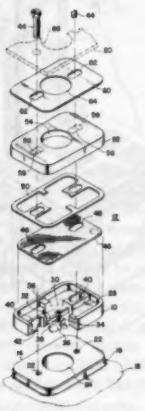
a substantially hollow bottom section;

means for breaking liquid gas into superfine particles being

disposed between said top section and said bottom section and comprising a screen means, said screen means having a planar cross-sectional area conformal with said cross-sectional area of said chamber whereby the said planar cross-sectional area of said screen through which said liquid gas passes is substantially greater than the outlet of said carburetor; and

vaporizing means,

said top and bottom sections having central holes on the exterior thereof of substantially the same size as the outlet of the carburetor and the inlet of the intake manifold, said top and bottom sections forming a chamber therebetween, said chamber having a cross-sectional area substantially greater than the cross-sectional area of said central holes.



7. In a gasoline engine having a chamber disposed between a carburetor and an intake manifold, said chamber having a screen therein and an agitator means therebelow, the method of vaporizing gas comprising the steps of:

passing the gasoline laden air leaving the carburetor into an expanding chamber having a width perpendicular to the direction of air flow substantially greater than the width of the inlet to the intake manifold;

passing the gasoline laden air from said chamber into a smaller passageway than that of said chamber;

directing the gasoline laden air from said smaller passageway over agitating means to thus subject said air to extreme turbulence; and

directing the gasoline laden air against the interior walls of said intake manifold to thus vaporize the gas particles in said gasoline laden air.

4,163,437

TRANSISTOR IGNITION CIRCUIT

John A. Notaras; Angelo L. Notaras, and James P. Williams, all of Sydney, Australia, assignors to Solo Industries Pty. Limited, New South Wales, Australia

Filed Oct. 14, 1976, Ser. No. 732,370

Claims priority, application Australia, Oct. 23, 1975, PC3692; Nov. 18, 1975, PC4013; Dec. 19, 1975, PC4350; Jan. 30, 1976, PC4678; Mar. 19, 1976, PC5272; Jun. 11, 1976, PC6234

Int. Cl.[2] F02P *1/08*

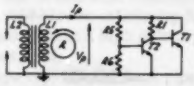
U.S. Cl. 123—148 E **22 Claims**

1. An ignition circuit for an internal combustion engine having a coil assembly including a primary winding with two ends and a magnet carrying rotor rotatable by said engine past said primary winding, said ignition circuit comprising:

first and second transistors, each having a collector, a base and an emitter, the collector of the first transistor being directly connected to one end of said primary winding and the emitter of the first transistor being directly connected to the other end of said primary winding, the second transistor having its collector-emitter conduction path connected in parallel with the base-emitter conduction path of said first transistor;

a first resistor connected between base and collector of the first transistor;

a potential divider directly connected across the ends of said primary winding, and the base of said second transistor being connected to a point of intermediate potential on



said potential divider wherein rotation of said rotor induces a voltage between the ends of said primary winding to cause said first transistor to conduct current from said primary winding directly through the collector-emitter conduction path of said first transistor, said second transistor being turned on by said intermediate potential to turn said first transistor off when said current exceeds a predetermined value.

4,163,438

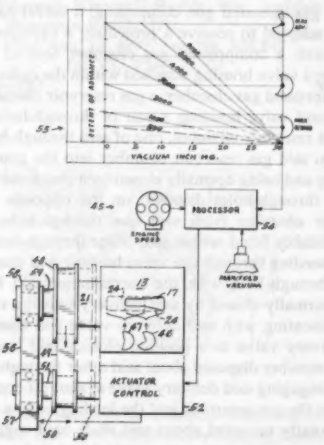
ROTARY VALVE TIMING APPARATUS

William D. Guenther, Hagerstown, Ind., and Philip J. Mazziotti, Toledo, Ohio, assignors to Dana Corporation, Toledo, Ohio

Filed Nov. 26, 1975, Ser. No. 635,714

Int. Cl.[2] F01L *7/00*

U.S. Cl. 123—190 A **2 Claims**



1. Adjustable valve timing apparatus for an internal combustion chamber, said apparatus chamber comprising a valve housing defining a housing port in open communication with the combustion chamber, said housing port having leading and trailing edges, a driven valve rotor within said valve housing and having at least one open passageway through said rotor and defining opposed open rotor ports for registry with said housing port upon rotation of said valve rotor, said rotor ports each having leading and trailing edges for registry with said edges of said housing port, and means adjacent said housing for shifting relative axial positions of said housing port and said rotor ports to adjust timing, wherein said leading and trailing

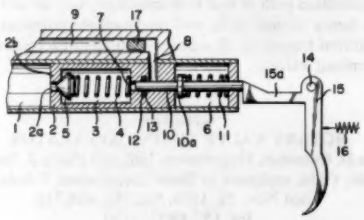
edges of said housing port are sloped to define opposite sides of a first triangle having a first orientation with respect to the axis of said rotor and said leading and trailing edges of said rotor port define opposite sides of a second triangle having a second orientation with respect to the axis of said rotor, and second triangle being inversely oriented with respect to said first triangle whereby said leading edges are parallel when said ports are in registry and said trailing edges are similarly parallel when said trailing edges are in registry.

4,163,439

APPARATUS FOR OPENING A DELIVERY VALVE IN A GAS RESERVOIR CHAMBER OF A COMPRESSED GAS OPERATED GUN

Kensuke Chiba, Tokyo, Japan, assignor to Sharp Rifle Co., Ltd., Japan

Filed Oct. 17, 1977, Ser. No. 842,413
Claims priority, application Japan, Aug. 19, 1977, 52/98745
Int. Cl.[2] F41F *1/04*; F41B *11/00*
U.S. Cl. 124—70 **1 Claim**



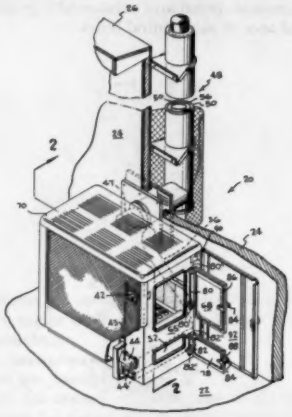
1. An apparatus for opening a delivery valve of a compressed gas operated gun comprising: a barrel having a bore therein adapted to receive a projectile; a cylinder secured to said barrel; a compressed gas chamber formed within said cylinder; a valve housing disposed within the cylinder adjacent the compressed gas chamber; a gas reservoir chamber disposed within said valve housing; a pair of through-holes extending into said reservoir chamber, one of said through-holes extending from said gas reservoir chamber into the compressed gas chamber and being normally closed by a check valve, the other of said through-holes disposed on the opposite side of said reservoir chamber from said one through-hole; a delivery valve slidably fitted within said other through-hole; a leading hole extending through the valve housing and connecting said other through-hole with the barrel bore, said leading hole being normally closed by said delivery valve; a return spring communicating with said delivery valve and biased to return the delivery valve to a position closing said leading hole; a sealing member disposed about said other through-hole and air tightly engaging said delivery valve to shut off communication between the gas reservoir and the leading hole; a shaft; a trigger pivotally mounted about said shaft, said trigger having a latch lever; a spring engaging said trigger and normally holding said latch lever in abutting engagement with said delivery valve, said latch lever being movable out of engagement with said delivery valve when said trigger is pulled, such that said delivery valve may be moved from its position closing the leading hole to compressed gas in the gas reservoir chamber, which compressed gas may then enter said bore through said leading hole, said delivery valve being normally engaged by and biased by said return spring; and, said shaft being disposed along the axial line of said delivery valve whereby when compressed gas is supplied into the gas reservoir chamber any torque due to the pressure force acting on the delivery valve is not produced in the trigger.

4,163,440

RADIANT HEATER

Hubert F. Stultz, Sale Creek, Tenn., assignor to Suburban Manufacturing Company, Dayton, Tenn.

Filed May 11, 1977, Ser. No. 796,019
Int. Cl.[2] F24C *1/08*
U.S. Cl. 126—60 **2 Claims**



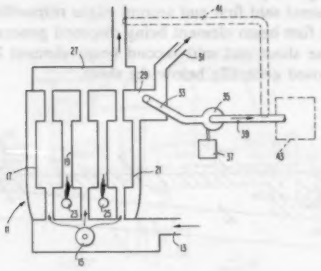
1. A radiant heater for burning firewood and the like to heat a living space, said radiant heater comprising an enclosure having a closed firewood combustion compartment with a fuel opening and an air inlet port through which air may pass to provide oxygen for supporting combustion of the firewood in the combustion compartment, a fuel door positioned to cover the fuel opening when the fuel door is closed, a torsion bar mounted on said enclosure with one end of the torsion bar positioned to engage the fuel door and the other end of the torsion bar positioned to engage the enclosure for forcing the door into a closed position when the door is not manually held open, said fuel door pivotally mounted on said torsion bar, a high temperature gasket surrounding the fuel opening and positioned between the fuel door and the combustion enclosure to seal the combustion compartment from the living space, an outer case surrounding the combustion enclosure for preventing contact thereof by any combustible material or persons, a baffle plate mounted on the case and spaced apart therefrom between the case and the wall of the living space to prevent the radiation of an excessive amount of heat to said wall, a flue pipe positioned outside the living space, an exhaust pipe extending through a wall of the living space, and connecting the combustion compartment with the flue pipe, an outside air inlet compartment having an opening to the outside and surrounding the portion of the exhaust pipe extending through said wall to permit air flowing through the outside air inlet compartment to cool the exhaust pipe, an air passageway duct connecting the air inlet compartment and the air inlet portion of the combustion chamber, a thermostatically controlled damper means in the passageway for controlling the rate of flow of air through the air passageway to achieve a desired heat output from the combustion enclosure thereby providing a thermostatically controlled radiant heater which utilizes only outside air for combustion and provides automatic cooling of the exhaust pipe extending through the wall to prevent overheating of the wall.

4,163,441

SYSTEM FOR RECLAIMING HEAT IN A FURNACE ARRANGEMENT

Tung C. Chen, 138 Wooded La., Villanova, Pa. 19085

Filed Apr. 5, 1978, Ser. No. 893,285
Int. Cl.[2] F24H *3/00, 3/02;* F24B *7/00*
U.S. Cl. 126—116 A **5 Claims**



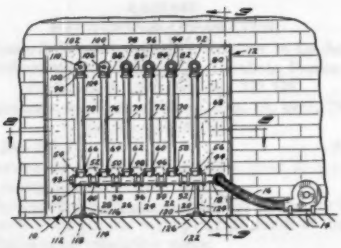
1. A system to reclaim heat to be employed with a furnace which has a heat exchanger and a flue means with an entry port comprising in combination: a by-pass duct means formed to be fitted into said furnace between said heat exchanger and said entry port to be able to intercept hot air passing from said heat exchanger to said flue; blower means to create a suction phenomenon in said by-pass duct means; pass-on duct means coupled to said blower means to direct hot air sucked through said by-pass duct to some facility to be heated; and control circuitry means connected to said blower means to insure that said blower means will not cause a suction phenomenon until some predetermined time after said furnace has stopped burning fuel.

4,163,442

FIREPLACE HEAT SYSTEM

Robert O. Welty, 7841 Eastwood Dr., Minneapolis, Minn. 55432

Filed Oct. 17, 1977, Ser. No. 842,745
Int. Cl.[2] F24B *7/00*
U.S. Cl. 126—121 **8 Claims**



1. Fireplace heat system for extracting heat from a fire in a fireplace comprising:

a. plurality of U-shaped structure means, each of said U-shaped structure means including two opposing substantially parallel horizontal legs of thick wall malleable black iron pipe and including threads on each end of each of said legs, plurality of substantially vertical connecting members of said black pipe and including threads on each end, and two pluralities of pipe elbows of said black pipe, each of said pipe elbows threaded onto each threaded end of said connecting member and one threaded end of each of said opposing legs;

b. air input manifold means connecting bottom legs of each of said plurality of U-shaped structure means together, said air input manifold means including plurality of alternating tees and nipples of said black pipe screwed together, said plurality of tees being one greater than said plurality of nipples, a plug of said black pipe screwed into the furthest end of said last tee, and said bottom legs of each of said plurality of U-shaped structure means connected to the bottom leg of each of said tees;

c. forced air input means connected to closet end of said first tee of said air input manifold means including a street elbow of said black pipe connected to the closest end of said first tee of said air input manifold means, one end of a hose connected to said street elbow with a hose clamp, and the other end of said hose connected to a blower with a hose clamp, said blower exhausting high velocity turbulent air into said pipes at a high velocity into said air input manifold means, said;

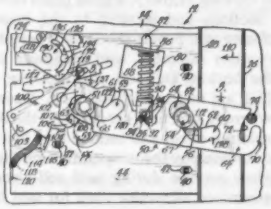
d. plurality of pipe caps of said black pipe including circular holes in said respective pipe caps and screwed onto said furthest threaded ends of top legs of said plurality of U-shaped structure means from said forced air means whereby said pipe caps restrict and balance the air flow over said U-shaped structure means, and turbulence is produced to maximize heat transfer from the fire in the fireplace to the environment adjacent the fireplace by the rough interior diameter as well as the exterior diameter of said thick wall malleable black iron pipe, by the boundary layers of air between said U-shaped structure means and said air input manifold means, by the air entering the bottom pipes of said plurality of U-shaped structure means, and by the forcing of the high velocity air around the plurality of angles of said pipes at said tees and elbows from said air input manifold means to said plurality of U-shaped structure means to further create turbulence thereby resulting in maximized heat transfer from the fire in the fireplace to the environment adjacent the fireplace where each of said black pipe is replaceable.

4,163,443

LATCH MECHANISM FOR AN OVEN DOOR

Stanley O. Peterson, Wisconsin Rapids, Wis., assignor to Preway, Inc., Wisconsin Rapids, Wis.

Filed Aug. 15, 1977, Ser. No. 824,847
Int. Cl.[2] F24C *15/02*
U.S. Cl. 126—197 **6 Claims**



1. A door latch mechanism mounted within an oven and engageable with a door of said oven for locking thereof, comprising:

a base plate with a support projecting therefrom and a pair of flanged guide rollers;

a latch plate carried by said base plate for movement between extended and retracted positions corresponding to open and closed positions, respectively, of said oven door, said latch plate having a pair of guide slots spaced along the length thereof, each said guide slot engaged by one said guide roller and including an enlarged portion of a diameter greater than that of its corresponding guide roller, each said roller engaging a guide slot for guiding said latch plate for movement between said extended and retracted positions; and

an over-center spring mechanism carried on said base plate and comprising an arm pivotally engaged with said latch plate and reciprocably received by said support, said arm including an abutment face at an end thereof closest to said latch plate, a spring carried by said arm between said abutment and said support, and an abutment stop carried by said arm and engageable with said stop when said latch plate is in its extended position, whereby said enlarged portions of said guide slots are prevented from engaging said flanged guide rollers, whereby said latch plate is yieldably retained in either said extended position or said retracted position.

4,163,444

DOOR FOR PYROLYTIC RANGE

Claude Drouin, Montmagny, Canada, assignor to Les Industries BFG Limitee, Montmagny, Canada

Filed Jan. 6, 1977, Ser. No. 757,434
Int. Cl.[2] F24C *15/04*
U.S. Cl. 126—198 **7 Claims**

1. A door for covering the oven cavity of a pyrolytic range having a high temperature self-cleaning cycle comprising: a front panel; an intermediate second panel spaced rearwardly of said front panel and defining therewith a first air passageway; an intermediate third panel spaced rearwardly of said second panel and defining therewith a second air passageway, a rear panel spaced rearwardly of said third panel and defining therewith a third air passageway, each of said panels having a window section in viewing registry, a glass panel covering each of said window sections and secured to the respective panel, means for enclosing said panels about their peripheral edges to form a unitary door assembly, said enclosure means having openings at the bottom and top edges of the assembly for allowing cooling air to flow in said first, second, and third passageways whereby said first, second, and third passageways provide an insulating effect and reduce heat loss through said window sections, whereby the temperature on the front face of said first window section during said self-cleaning cycle is below a predetermined allowable limit for said front face.

4,163,445

ROOFING PANELS

Colin N. Stanger, Niavaran. 3 Grenville, Close, Cobham, Surrey, England

Filed Apr. 1, 1977, Ser. No. 783,787
Claims priority, application United Kingdom, Apr. 2, 1976, 13467/76
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—428 **15 Claims**

1. In a roof structure of the type described, the combination of

a roof support structure;

a plurality of interlocking elongated roofing panels mounted on said support structure to form a roof covering, each of said panels comprising an elongated sheet having

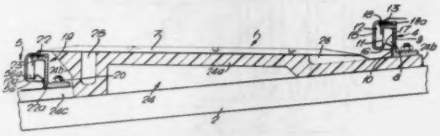
a first elongated edge,

a second elongated edge spaced from and opposite to said first edge,

the panel being secured to the support structure only along said first elongated edge,

first and second load-bearing beam elements which extend continuously along the length of the panel and support the panel on the support structure and are formed by elongated portions of said sheet of bent configuration adjacent said first and second edges respectively,

said first beam element being disposed generally above the sheet and said second beam element being disposed generally below the sheet,



a plurality of ribs spanning transversely between said beam elements for transmitting the load of the panel thereto,

the first beam element supporting said second elongated edge of the next adjacent panel, and

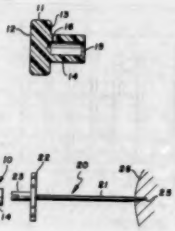
the second beam element constituting a cover element which overlaps the first beam element of the next adjacent panel and engages the same continuously along its entire length so as to at least partially conceal the first beam element and restrain said second elongated edge against movements in a direction normal to the plane of the panel.

4,163,446

BIOPSY NEEDLE AND REMOVABLE PAD THEREFOR

Khosrow Jamshidi, 610 Winston Ct., St. Paul, Minn. 55118

Filed Jan. 31, 1978, Ser. No. 873,783
Int. Cl.[2] A61B *10/00*
U.S. Cl. 128—754 **3 Claims**



1. In combination, a biopsy needle having an elongated hollow body member with a distal cutting edge and a proximal gripping portion, and a radially extending finger gripping means near the proximal end thereof; and pad means removably mounted upon said hollow body member at the proximal end thereof;

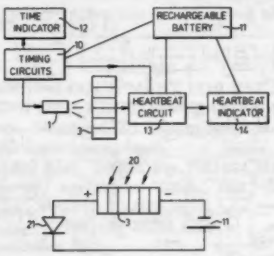
(a) said pad means comprising a generally disc-shaped element with first and second opposed major surfaces, said first surface being a palm engaging surface and with said second surface having a needle enveloping sleeve extending outwardly from the surface thereof; and

(b) said needle enveloping sleeve having a radially extending bore formed through the wall thereof adjacent the juncture between said second pad surface and said sleeve for providing communication between the interior of said sleeve and atmosphere.

4,163,447
HEARTBEAT RATE MONITOR

Thomas Orr, Starboard House, 30 Shore Rd., Warsash, Southampton, England

Filed Jan. 31, 1978, Ser. No. 873,977
Claims priority, application United Kingdom, Feb. 11, 1977, 5746/77
Int. Cl.[2] A61B 5/02
U.S. Cl. 128—666 9 Claims



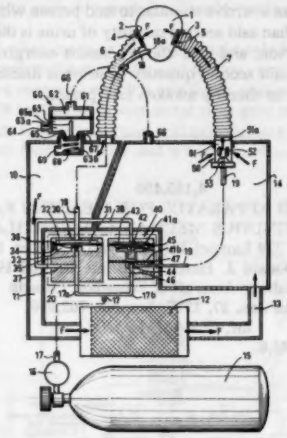
1. A heartbeat rate monitor comprising:
a light source for transilluminating skin tissue;
semiconductor detector means disposed to receive light from said light source reflected from said skin tissue and capable of detecting variations in the level of said light reflected from said skin tissue so as to produce an electric signal responsive to changes in arterial blood flow in said skin tissue, said detector means also being capable, on exposure to ambient light, of supplying a recharging current for a power source;
indicator means for indicating the heartbeat rate in dependence on said electric signal;
means for supplying said electric signal from said detector means to said indicator means;
a rechargeable electric power source;
means to supply said current from said detector means to said power source to recharge said power source; and
means to energise said light source from said battery.

4,163,448
BREATHING APPARATUS

Gérard Grouard, Versailles, France, assignor to La Spirotechnique, Industrielle et Commerciale, Levallois, France

Filed Sep. 8, 1976, Ser. No. 721,528
Claims priority, application France, Sep. 15, 1975, 75 28202
Int. Cl.[2] A62B 7/02
U.S. Cl. 128—142.2 8 Claims

1. Apparatus for supplying breathable fluid to a user, the apparatus comprising, in combination:
a mask having an inhalation orifice, an exhalation orifice and a control orifice in the region of the mouth of the user;
means defining an inhalation space;
an inhalation duct interconnecting the inhalation space and the inhalation orifice;
a supply of breathable fluid under pressure;
means including a supply conduit having an infeed end connected to said supply and a discharge end communicating with the inhalation space;
valve means interposed in the supply conduit and being movable in response to the application of fluid pressure between a closed position blocking the flow of unused fluid in said conduit and an open position permitting the passage of unused fluid to said discharge end;
conduit means interconnecting the valve means and the supply of breathable fluid for applying pressure to said valve means to maintain it in its closed position; and
a pressure sensing mechanism interposed in the conduit means for regulating the valve means in response to the respiratory pressure in the region of the mouth of the user, the pressure sensing mechanism including a control conduit connected to the control orifice in said mask and means responsive to a decrease in pressure in said mask for

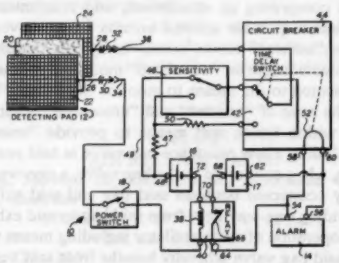


moving the valve means to its open position to thereby permit the flow of fluid from the discharge end of the supply conduit.

4,163,449
ENURESIS TREATMENT DEVICE

Robert A. Regal, 555 Kappock St., Riverdale, N.Y. 10471

Filed Sep. 30, 1977, Ser. No. 838,110
Int. Cl.[2] A61B 5/00
U.S. Cl. 128—138 A 8 Claims



1. A device for treating an enuretic person by conditioning said person to avoid nocturnal bed wetting, said device comprising:
a urine detecting pad arranged to be placed underneath said person while asleep for absorbing urine discharged by said person, said pad changing its state in corresponding relationship with the quantity of urine absorbed by said pad;
detection signal means coupled to said detecting pad for producing detection signals corresponding to the state of said urine detecting pad;
an alarm for providing an aversive stimulus to said person;
alarm energization means coupled to said alarm and said detection signal means for energizing said alarm when said detection signals are above a first level corresponding to a first quantity of said absorbed urine; and
alarm cutoff means coupled to said alarm and said detection signal means for disabling said alarm after a particular elapsed time when said detection signals are below a second level corresponding to a second quantity of said absorbed urine, and for allowing said alarm to remain

energized when said detection signals are above said second level;

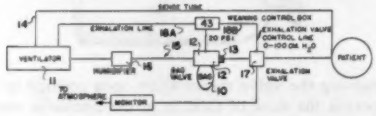
whereby said alarm is energized only over a sufficient time to provide an aversive stimulus to said person while asleep when less than said second quantity of urine is discharged by said person, and said alarm remains energized when more than said second quantity of urine is discharged by said person to thereby awaken said person.

4,163,450

METHOD AND APPARATUS FOR WEANING PATIENT FROM CONTINUOUS MECHANICAL VENTILATION

Bryan W. Kirk, 229 Lamont Blvd.; Monte B. Raber, 83 Coralberry Ave.; Donald J. Hatch, 91 Brian St., and Harvey E. Cramp, 122 Balfour Ave., all of Winnipeg, Canada

Filed Jan. 27, 1977, Ser. No. 762,990
Int. Cl.[2] A61M *16/00*
U.S. Cl. 128—145.8 **8 Claims**



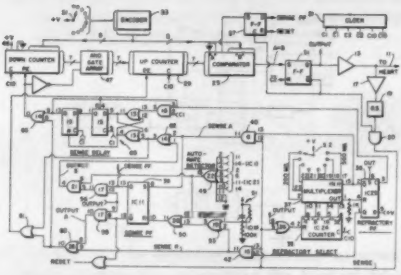
1. In a conventional ventilator which supplies assisted or unassisted breaths to a patient including a pneumatic connection extending from said ventilator, an exhalation valve operatively connected to said pneumatic connection, patient connection means extending from said exhalation valve, an exhalation valve control line operatively connected between the ventilator and the exhalation valve and means operatively connected to said exhalation valve to monitor exhaled breaths; the improvement comprising an attachment, said attachment comprising means to provide assisted breaths from the ventilator when in an "assisted" mode, means to by-pass breaths from said ventilator when in an "unassisted" mode and means operatively connected to the means to monitor the exhaled breaths whereby the ratio of "assisted" and "unassisted" breaths may be varied within limits, said means to provide "unassisted" breaths including a low resistance bag valve in said pneumatic connection, a bag connected to the bag valve, a one-way valve operatively connected between said bag and said exhalation valve providing one-way flow from said bag to said exhalation valve, the operation of said ventilator including means to open and close said bag valve whereby breaths from said ventilator are conveyed directly to said patient connection means when said bag valve is closed and said ventilator is in the "assisted" mode, and to the bag and thence to said patient connection means as required, when said bag valve is open and said ventilator is in the "unassisted" mode, said means operatively connected to said means to monitor the exhaled breaths whereby the ratio of "assisted" and "unassisted" breaths may be varied within limits, including a pressure sensor in said exhalation valve control line, a signal generator operatively connected to said pressure sensor and operated thereby each time the exhalation pressure within said control line exceeds a predetermined pressure, assisted breath counter means, and unassisted breath counter means, means operatively connecting said signal generator to said assisted breath counter means when in the "assisted" mode and to said unassisted breath counter means when in the "unassisted" mode, means to vary the ratio of connection of said signal generator to said assisted and unassisted counter means, a bag valve solenoid operatively connected to said bag valve and means to operate said bag valve solenoid operatively extending from said unassisted breath counter means to said solenoid.

4,163,451

INTERACTIVE METHOD AND DIGITALLY TIMED APPARATUS FOR CARDIAC PACING ARRHYTHMIA TREATMENT

Alan F. Lesnick, and Peter P. Tarjan, both of Miami, Fla., assignors to Cordis Corporation, Miami, Fla.

Filed Oct. 26, 1977, Ser. No 845,650
Int. Cl.[2] A61N *1/36*
U.S. Cl. 128—419 PG **15 Claims**



1. Cardiac pacing apparatus comprising:

timing means for generating a series of clock pulses; means responsive to heartbeats;

means for counting clock pulses occurring from a first heartbeat to a second heartbeat thereby to obtain a first value representing the time interval between heartbeats;

means for generating a value which is smaller than said first value and which represents an escape interval;

means for counting clock pulses occurring after said second sensed heartbeat to obtain a running time value;

means for comparing said running time value with said escape interval value; and

means responsive to said comparison for generating a stimulating pulse and for incrementing said escape interval value if said running time value becomes substantially equal to said escape interval value.

4,163,452

TOBACCO-SMOKE FILTERS

John D. Green, Romsey, and Ian R. Harris, Alton, both of England, assignors to British-American Tobacco Company Limited, London, England

Filed Dec. 1, 1977, Ser. No. 856,344
Int. Cl.[2] A24B *15/27*; B01D *27/02*
U.S. Cl. 131—10 A **11 Claims**

1. An improved tobacco-smoke filter or filter material containing granules of porous activated carbon to which a nitroxide of the group consisting of the nitroxide 4-oxo-2,2,6,6-tetramethylpiperidino-oxy, the nitroxide 1-nitronyl-3-oxyl-4,4,5,5-tetramethyl-2-phenyldihydroimidazole and mixtures thereof has been applied.

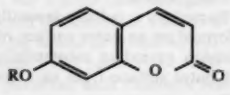
4,163,453

7-ALKOXY-1,2-BENZOPYRONES AS TOBACCO FLAVORANTS

Andrew G. Kallianos, Durham, N.C., and Melvyn I. Simpson, Fargo, N. Dak., assignors to Liggett Group Inc., Durham, N.C.

Filed Oct. 12, 1976, Ser. No. 731,382
Int. Cl.[2] A24B *3/12, 15/04*
U.S. Cl. 131—17 R **12 Claims**

9. A tobacco or smoking tobacco product having added thereto about 0.0001 to about 0.1 weight percent, based on the weight of the tobacco, of at least one compound having the formula:



wherein R is selected from the group of straight or branched chain alkyl or alkenyl groups, having from 1 to 7 carbon atoms in the alkyl or alkenyl chain or a cyclic aliphatic or aromatic hydrocarbon group having less than 8 carbon atoms.

4,163,454

PROCESSING EQUIPMENT FOR USE IN THE PROCESSING OF A PHOTOENGRAVING CYLINDER

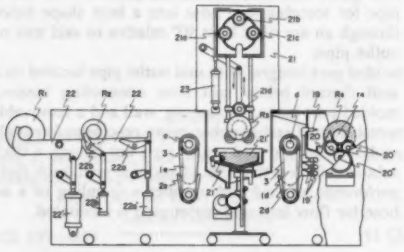
Tatsuo Shigeta, Nagareyama, Japan, assignor to Kabushiki Kaisha Think Laboratory, Japan

Filed Mar. 7, 1978, Ser. No. 884,152

Claims priority, application Japan, Oct. 28, 1977, 52-144901[U]; Nov. 30, 1977, 52-160638[U]

Int. Cl.[2] B08B *3/08*

U.S. Cl. 134—57 R **3 Claims**



1. In combination with automatic processing equipment for processing a photoengraving cylinder having an axis including a plurality of processing baths and swinging support means for moving the cylinder between baths, a device comprising:

a sliding member longitudinally slidably mounted in a groove on one of said baths,

means for moving said sliding member longitudinally along said groove axially of the cylinder in said bath,

a pair of proximity switches displacably mounted on said sliding member,

means for displacing said pair of proximity switches radially relative to the cylinder, and

means for computing processing factors from the dimensions of the cylinder sensingly connected to and controlling said means for moving and said means for displacing, said means for computing receiving its inputs from said pair of proximity switches whereby the axial length and diameter of the cylinder can be read and calculations therefrom performed.

4,163,455

CLEANING APPARATUS FOR SHIP HOLDS

Chris J. Hebert, and Ralph T. Hollister, both of 157 N. Leo, Baton Rouge, La. 70806

Filed Nov. 14, 1977, Ser. No. 851,342

Int. Cl.[2] B63B *59/00*

U.S. Cl. 134—167 R **7 Claims**

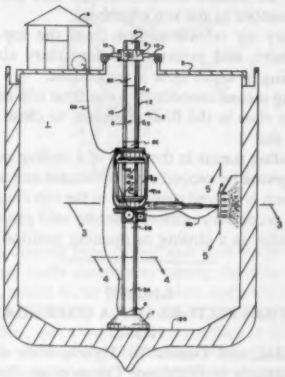
1. An apparatus for cleaning a ship hold formed by a floor, side walls and ship deck having a hatch opening, which comprises:

(a) a central support axle vertically positionable within said hold, said central support axle comprising a metal strip having gear teeth extending into a straight line down said axle;

(b) a first securing means attached to said axle and attachable to said floor for fixedly holding said axle to said floor;

(c) a second securing means attached to said axle and attachable to said ship deck for fixedly holding said axle vertically;

(d) a trolley carriage attached to said axle for vertical travel up and down said axle, said trolley carriage comprising a drive means to which is attached a gear wheel having gear teeth mating with said metal strip gear teeth, a mounting brace extending around said axle forming a cavity opening away from said axle and wherein said nozzle positioning



assembly comprises a circular metal block fitting into said cavity, bearing collars attached to said block and in contact with said mounting brace, a gear wheel having gear wheel teeth extending out of said cavity is attached to said block and a drive means, having a drive means gear with teeth mating with said gear wheel teeth attached to said mounting brace; and

(e) a nozzle positioning assembly rotatably attached to said trolley carriage, said nozzle assembly having an extendable arm to which are attached water nozzles for spraying water.

4,163,456

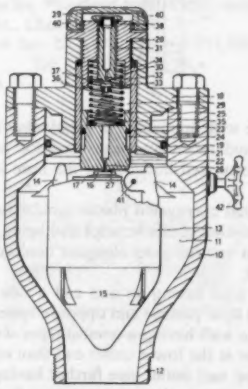
AIR RELEASE VALVE

Keith R. Herron, 15 Blackburn St., Moorooka, Queensland 4105, Australia

Filed Sep. 12, 1977, Ser. No. 832,471

Int. Cl.[2] F16K *31/22*

U.S. Cl. 137—202 **4 Claims**



1. An air release valve including:

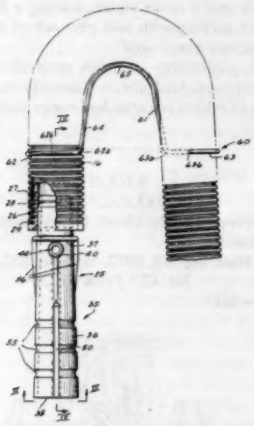
a body,
a float chamber in the body,
a passage to the float chamber for connection to a pipe liner or container,
a float vertically movable in the float chamber,
a top chamber in the body,
a movable member in the form of a piston vertically movable in the top chamber and adapted to be raised in the top chamber by the float rising in the float chamber or by gas pressure in the float chamber, and first resilient means for biasing said piston downwardly,
a primary air release orifice through said piston from the float chamber to the top chamber,
a secondary air release orifice from the top chamber to atmosphere, said primary and secondary air release orifices being in series flow arrangement,
first sealing means connected to the float and adapted, when the float rises in the float chamber, to close said primary orifice, and
second sealing means in the form of a sealing pad connected to said piston by second resilient means and adapted when said piston is moved upwardly in the top chamber to close the said secondary orifice, whereby said piston can exert a force either in a closing or opening position.

4,163,457

TERMINATION FIXTURE FOR A CORRUGATED DRAIN HOSE

William Rickel, and Dennis W. Hauch, both of St. Joseph, Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed May 2, 1977, Ser. No. 793,137
Int. Cl.[2] F03C *1/12*
U.S. Cl. 137—216 **3 Claims**



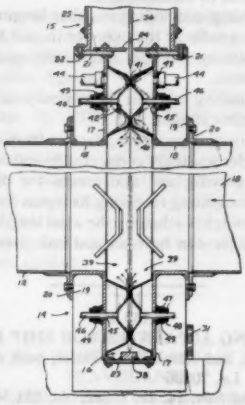
1. For use with appliances in positioning a hose relative to different liquid receiving means and for receiving and discharging pressurized liquid from the hose into the receiving means,
an elongated corrugated plastic tubular hose having favorable anti-kink characteristics and being selectively bendable but returning to elongate configuration when unstressed;
an outlet pipe having an axis and a side wall forming an internal flow passage and opposite upper and lower ends, said side wall having a conical taper with a larger inside diameter at the lower outlet end than at the upper end of said pipe, said outlet pipe further having
at least one annular groove means formed therein near said lower end to reduce locally a radial thickness of said side wall, thereby to facilitate severing said pipe to shorten its length, and
an air vent formed by a radially inwardly extending depression formed on an outer surface of said side wall, said depression extending substantially longitudinally along said outer surface from said lower end of said outlet pipe,
a plurality of planar ribs extending radially outwardly from said outer surface of said side wall, said ribs extending longitudinally along a portion of said outlet pipe;
a hose connecting means on the upper end of said outlet pipe for receiving the corrugated hose in fluid-tight relation thereto and for communicating an interior of the hose to said internal flow passage,
said hose connecting means comprising a nipple formed integrally with said upper end of said outlet pipe, said nipple having an annular groove formed near an end thereof, and a deformable cylindrical sleeve, said sleeve having a diameter intermediate between an inside diameter of said hose, and an outside diameter of said nipple, said sleeve being fitted inside said hose prior to engagement with said nipple;
a hose guide means operatively associated with said outlet pipe for securing said hose into a bent shape extending through an arc of at least 90° relative to said axis of said outlet pipe;
a molded port integral with said outlet pipe located on a side wall thereof below said hose connecting means, said molded port having an annular wall and a removable end member, said end member being co-circumferential with said side wall of said outlet pipe but having a thickness substantially less than that of said side wall, such that upon perforation of said end member a coupling of a second hose for flow into said outlet pipe is facilitated.

4,163,458

DEVICE FOR SEALING A CONDUIT AGAINST THE FLOW OF LIQUID

Lothar Bachmann, P.O. Box 47, West Minot, Me. 04288

Filed Mar. 18, 1977, Ser. No. 778,879
Int. Cl.[2] F16K *3/36*
U.S. Cl. 137—240 **5 Claims**



1. A device such as a damper or valve for use in blocking the flow of fluid through a conduit, said device including a chamber surrounding and opening into the conduit and including side walls sealed thereto, a blade mounted at one side of the conduit for movement through the chamber transversely of the conduit between a first position outside the conduit and a second conduit-blocking position, means carried by each side wall and surrounding said conduit and between said conduit

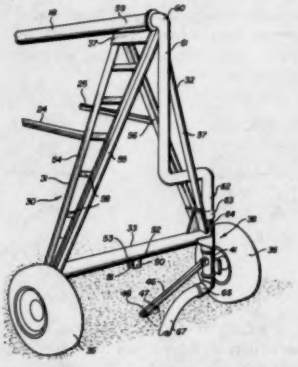
and said blade when the blade is in its first position and operable then to coact and seal the chamber against leakage through it and to engage and seal the blade when in its second position, both of said sealing means an inflatable seal operated by fluid under pressure from a first position out of the path of the blade into its sealing positions, each inflatable seal including inner and outer sealing portions sealed to the appropriate one of the chamber side walls and an intermediate channel, first seal control means to deliver fluid under pressure to said sealing portions to effect and maintain their sealing positions, second seal control means to relieve said seals of operating pressure, and third control means in communication with said intermediate channels and operable to deliver fluid thereto under a pressure that is greater than the pressure of the fluid within the conduit thereby to block the flow of the conduit fluid along the path of said blade as it moves between said positions and to purge the sealing means and blow back into the exhaust stream settled debris.

4,163,459

MOBILE PIVOT TOWER FOR IRRIGATION SYSTEM

Kenneth J. Hegemann, Ewa Beach, Hi., assignor to Rainmatic International, Ltd., Honolulu, Hi.

Filed Oct. 26, 1977, Ser. No. 845,648
Int. Cl.[2] B05B 3/12
U.S. Cl. 137—344 **11 Claims**



1. A mobile pivot tower for an irrigation system, said mobile pivot tower comprising:

substantially vertically disposed frame means having upper and lower portions;

means at the upper portion of said frame means for supporting an irrigation pipe in a horizontal disposition extending away from said frame means;

a pair of wheels located adjacent the lower portion of said frame means;

each of said wheels having a horizontal axis of rotation disposed transverse to the direction in which said irrigation pipe extends;

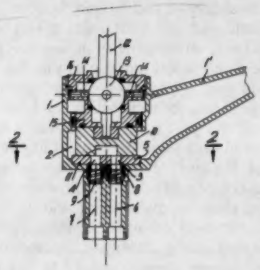
and means mounting said frame means and one of said wheels for free pivotal movement about a vertical axis during an irrigating operation of said system, said mounting means being located adjacent the other of said wheels while said other wheel remains stationary.

4,163,460

SINGLE-CONTROL TYPE OF HOT COLD WATER MIXER

Mario Zucchetti, Gozzano, Italy, assignor to Zucchetti Rubinetteria S.p.A., Gozzano, Italy

Filed Jul. 18, 1977, Ser. No. 816,673
Claims priority, application Italy, Jul. 26, 1976, 21837/76[U]
Int. Cl.[2] F16K 11/06
U.S. Cl. 137—625.4 **1 Claim**



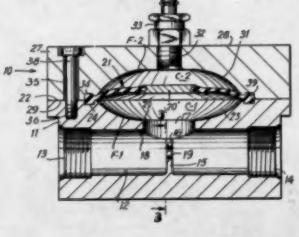
1. A single-control type of hot and cold water mixer comprising a mixer body member or casing defining a hot water inlet conduit, a cold water inlet conduit, and a mixing chamber, said hot and cold water inlet conduits opening towards said mixing chamber, and a water delivery orifice in direct communication with said mixing chamber, a mixing unit positioned within said mixing chamber and operable between a closed position, a hot water or cold water open position, and a mixing position, said mixing unit comprising a one-piece disc of ceramic material fixedly mounted within said mixing chamber having first and second apertures only extending therethrough and in fixed fluid communication with said hot and cold water inlet conduits, respectively, and free of any outlet apertures, a movable block of ceramic material having a flat face sealingly slidable against a flat face of said disc, a control handle connected to said movable block to move said movable block in said mixing chamber with respect to said disc, said block having a cavity opening to said flat face and extending substantially radially to a side edge surface of said movable block to define a water passage from said inlet conduits to the mixing chamber that is exterior to said movable block, the width of the block cavity being larger than the distance or spacing between the apertures in said ceramic disc in order to communicate with either or partially with both the apertures in said disc.

4,163,461

HIGH FREQUENCY PULSE DAMPENER

Alfonse A. Jacobellis, Woodland Hills, Calif., assignor to Greer Hydraulics, Inc., Chatsworth, Calif.

Filed Jan. 23, 1978, Ser. No. 871,503
Int. Cl.[2] F16L 55/04
U.S. Cl. 138—30 **2 Claims**



1. A high frequency pulse dampener device comprising a

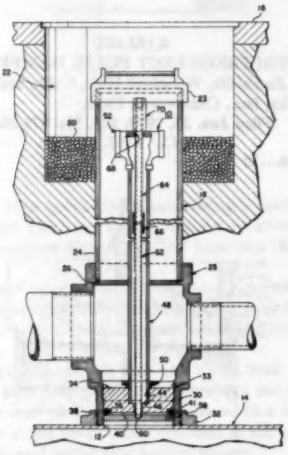
rigid casing having a bore therethrough defining a conduit member, an upwardly directed aperture formed in said casing at right angles to said bore and in communication therewith at one end, said casing having an upwardly extending concave recess defining an oil chamber, said recess having a floor, said other end of said aperture being exposed in said floor and axially positioned therein, the periphery of said other end of said aperture defining a valve seat, a partition formed in said casing in registry with said aperture, said partition being directed normal to said bore and having its outer terminal edge portions coincident with the walls defining said bore, the upper edge of said partition terminating in proximate spaced relation to said valve seat and below the top of said bore, there being defined between said upper edge of said partition and said aperture, passage means for conducting fluid through said bore from one side of said partition to the other, a restricted flow aperture formed in said partition in axial alignment with said conduit member, the level of said valve seat being spaced from the level of the axis of said restricted flow aperture a distance substantially less than the diameter of said upwardly directed aperture, a second rigid casing complementary to said first casing, said second casing having a downwardly extending concave recess therein complementary to the recess in said first casing and defining a gas chamber, said second recess having a top wall, a port extending through said second casing axially into said second recess, a gas charging member mounted in said port, means to retain said casings together with said recesses in juxtaposition, a distensible, resilient diaphragm member clampingly supported at its periphery between said two casings, said oil chamber and said gas chamber being formed respectively between said diaphragm member and the floor and top wall of the recesses in said casings, and a valve member carried by said diaphragm and shiftable into sealing and unsealing relation against said valve seat responsive to movements of said diaphragm respectively toward and away from said seat, the area of said upwardly directed aperture being at least ten percent of the area of the diaphragm member which is exposed to the flow of fluid through said aperture.

4,163,462

TEST PLUG

August Milo, Elizabeth, N.J., assignor to Universal Valve Co., Inc., Elizabeth, N.J.

Filed Nov. 7, 1977, Ser. No. 849,319
Int. Cl.[2] F16L *55/12*
U.S. Cl. 138—90 **19 Claims**



1. A test plug for sealing an internal passageway of a vessel preparatory to pressure testing the vessel with a fluid, the passageway including an internally threaded section and an adjacent non-threaded section, said plug including:

a seal plate adapted to be inserted into the threaded section of the passageway, said seal plate having an externally threaded section adapted to threadedly engage the threaded section of the passageway;

an inserting stem connected to the seal plate and extending outwardly therefrom, said stem aiding in the insertion of the seal plate into the interior of the passageway and in threadedly engaging the seal plate threaded section with the passageway threaded section;

a compressible sealing member adjacent a lower surface of the seal plate;

a squeeze plate underlying the sealing member and seal plate, said squeeze plate being adapted to fit within the said passageway non-threaded section and to be longitudinally movable therewithin; and

squeeze plate actuating means for moving the squeeze plate upwardly within the passageway non-threaded section toward the seal plate for compressing the sealing member and thereby forcing said member laterally into sealing engagement with the interior surface of the vessel passageway.

4,163,463

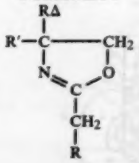
OXAZOLINE WAX IMPREGNATED SAUSAGE CASING

Merrill N. O'Brien, Jr., Danville, Ill., assignor to Teepak, Inc., Chicago, Ill.

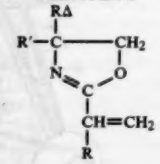
Division of Ser. No. 538,636, Jan. 6, 1975. This application Nov. 9, 1978, Ser. No. 959,396
Int. Cl.[2] F16L *11/08*; C08B *9/00*
U.S. Cl. 138—118.1 **6 Claims**

1. An artificial sausage casing of regenerated cellulose having impregnated therein from about 1–15% by weight of the cellulose in the casing of an oxazoline wax selected from the group consisting of:

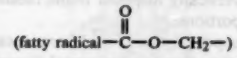
FORMULA 1



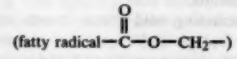
FORMULA 2



wherein R is a fatty acid radical having from 10–24 carbon atoms in the structure, R′ is a methylol group, an alkyl group having from 1–10 carbon atoms in the structure, or a fatty acid ester radical



with the fatty radical portion having from 10–24 carbon atoms and not more than 1 unsaturated group and R″ is a methylol group, an alkyl group having from 1–20 carbon atoms, or a fatty acid ester radical



with the fatty radical portion having from 10–24 carbon atoms and not more than 1 unsaturated group.

4,163,464

ARRANGEMENT FOR FILLING A VESSEL WHICH IS TO BE PUT UNDER HIGH PRESSURE, WITH FREELY FLOWING SOLIDS

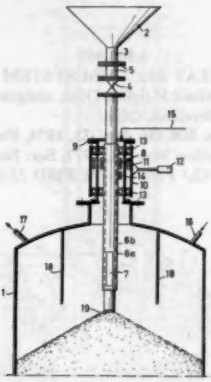
Günter Velling, Bornheim-Hersel, and Wolfhard Ruddeck, Wuppertal, both of Fed. Rep. of Germany, assignors to Rheinische Braunkohlenwerke AG, Fed. Rep. of Germany

Filed Feb. 2, 1978, Ser. No. 874,670

Claims priority, application Fed. Rep. of Germany, Feb. 11, 1977, 2705763

Int. Cl.[2] B65B *31/00, 1/30, 57/14*

U.S. Cl. 141—198 3 Claims



1. An arrangement for filling a vessel which is to be put under high pressure, with freely flowing solids from a storage vessel which is under normal pressure, comprising a supply line extending from the storage vessel to the pressure vessel and having an open-ended part extending into the pressure vessel, a pressure sealing valve which can be tightly closed to counter the working pressure in the pressure vessel, a shut-off valve which is suitable for sealing the storage vessel, both valves being arranged one behind the other in the supply line, and a tube which extends over said part of the supply line within the pressure vessel, said part of the supply line and said tube each having at least one aperture in their walls, the tube and said supply line being arranged so that relative rotational movement therebetween opens and closes the aperture or apertures in said supply line.

4,163,465

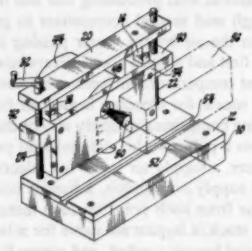
APPARATUS FOR CUTTING DOVETAIL JOINTS

Donald Strong, 33165 Bock, Garden City, Mich. 48135

Filed Aug. 17, 1977, Ser. No. 825,300

Int. Cl.[2] B27F *1/04*

U.S. Cl. 144—87 2 Claims



1. Apparatus for forming a dovetail groove in a wooden workpiece comprising:

a base member;

a pair of spaced, elongated slide members mounted on the base member;

a support member mounted between the slide members so as to be slidably movable therealong;

a power driven router mounted on the support member so as to be movable therewith, and a cutting tool carried by the router so as to be rotated in a cutting motion about an axis spaced from the base member;

adjustment means carried on the base member, said adjustment means comprising an elongated rotatably supported threaded member, the support member being connected to the threaded member so as to be moved between adjusted positions with respect to the base member as the threaded member is being rotated; and

the support member and the base member being disposed to form a sliding support for a workpiece being moved along a path of motion at right angles to the axis of rotation of the cutting tool such that the cutting tool is operative to cut a dovetail slot in such workpiece.

4,163,466

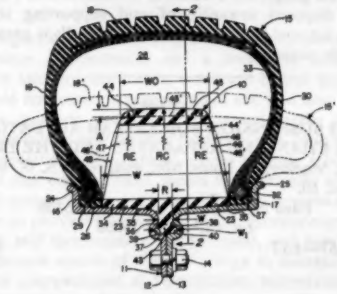
TUBELESS TIRE, SAFETY SUPPORT AND RIM ASSEMBLY

George T. Watts, North Canton, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 695,945, Jun. 14, 1976, abandoned. This application Dec. 8, 1977, Ser. No. 858,703

Int. Cl.[2] B60C *17/04*

U.S. Cl. 152—158 3 Claims



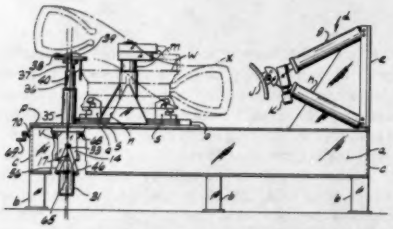
1. A tire, safety support and rim assembly comprising a split wheel rim with axially abutting sections, a pneumatic tire having a tread portion and bead portions mounted in axially spaced-apart bead seats on a generally cylindrical surface of said rim, an annular ring member of flexible resilient cushioning and sealing material having a radially inner base portion with a generally cylindrical radially inner surface mounted on said surface of said rim and extending from one of said bead portions to the other, said ring member having a radially outer portion with an outer diameter less than the diameter of said tread portion of the tire in the inflated condition and greater than the diameter of said inner base portion, an intermediate supporting portion of said ring member between said radially inner base portion and said radially outer portion, said base portion including a circumferentially continuous flange of said cushioning and sealing material on said radially inner surface of said base portion, said flange having an enlarged bulbous edge portion clamped in compression between said sections of said split rim and sealing the space between said sections, said inner surface having a base width measured axially of said ring member, said flange having a flange width measured axially of said ring member, and said base width being substantially greater than said flange width for stable transmission and cushioning of the load from said base to said rim by compression of said ring member and for holding said bead portions in a stable separated condition on said bead seats during operation

of said tire in a deflated condition with said outer portion of said ring member in engagement with said tread portion.

4,163,467
SELF-SEALING PNEUMATIC TIRE
Robert L. Dobson, Tallmadge, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Jun. 8, 1973, Ser. No. 368,145
Int. Cl.[2] B60C *19/12*
U.S. Cl. 152—347 **17 Claims**

1. A self-sealing pneumatic tire which comprises two spaced inextensible beads, a ground contacting tread portion, a pair of individual sidewalls extending radially inward from the axial outer edges of said tread portion to join the respective beads, a supporting structure for said tread portion and sidewalls and an integral, thin gauge, covulcanized, resilient rubber closed cell structure disposed inwardly of said supporting structure, where the internal pressure of said closed cells is greater than atmospheric pressure.

4,163,468
PIVOTED SUSPENSION FOR LINEAR ACTUATORS OF TIRE CHANGING APPARATUS AND THE LIKE
Thomas L. Mueller, St. Louis, Mo., assignor to S. W. Malinski, Tamaroa, Ill.
Filed Nov. 3, 1977, Ser. No. 848,139
Int. Cl.[2] B60C *25/06*
U.S. Cl. 157—1.17 **5 Claims**



1. In a tire changer having a horizontal work support provision and a linear actuator having its casing supported by a support frame beneath the level of the actuator pivotally in the support frame and for urging it to a substantially vertical position, the improvement comprising

opposed horizontal trunnion means to suspend said actuator in said support frame for pivoting.

forward arm and follower means to pivot outward relative to said support frame in a forward direction on corresponding movement of said casing,

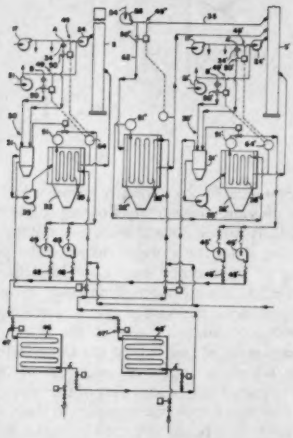
aft arm and follower means to pivot outward relative to said support frame in an aft direction on corresponding movement of said casing,

stop means for said forward and aft arm and follower means, fixedly associated with said support frame, to limit aft pivoting of said forward arm and follower means and to limit forward pivoting of said aft arm and follower means, and

spring means, operably associated with said forward arm and follower means and with said aft arm and follower means, to urge each said arm and follower means against said stop means,

whereby by said spring means the pivoting freedom of said linear actuator is restrained and on pivoting it is urged to a substantially vertical position.

4,163,469
HEAT RECLAIM SYSTEM
Alan English, Cleveland Heights, Ohio, assignor to Hanna Mining Company, Cleveland, Ohio
Division of Ser. No. 508,184, Sep. 23, 1974, Pat. No. 4,067,382.
This application May 18, 1977, Ser. No. 797,937
Int. Cl.[2] F28F *27/00*; F28D *15/00*
U.S. Cl. 165—35 **13 Claims**



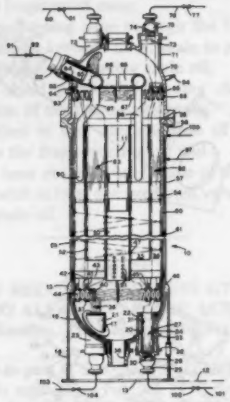
1. A heat reclaim system for reclaiming waste heat from a material heat processing line comprising a first economizer containing a bank of serpentine coils for passage of water therethrough, means for bleeding heated air from one point on a material heat processing line and directing such heated air through said first economizer to permit extraction of heat from the air by the water passing therethrough, a second economizer containing a bank of serpentine coils for passage of water therethrough, and means for bleeding heated air from another point on such material heat processing line and directing such heated air through said second economizer to permit extraction of heat from the air by the water passing therethrough, said coils of said first and second economizers being in series to create the highest temperature difference between the air and water, each said means for bleeding heated air from the material processing line comprising a supply air conduit for passage of heated air from a point on the material heat processing line to said economizer, a supply air valve for selectively opening and closing said supply air conduit, a bypass conduit for passage of heated air from such point on such material heat processing line to a stack, a bypass air valve for selectively opening and closing said bypass conduit, and means for closing said supply air valve and opening said bypass air valve for stopping air flow through said economizer in response to a drop in the bleed-air temperature below a predetermined level to provide automatic dew point safety control.

4,163,470

INDUSTRIAL TECHNIQUE

Arne A. Johnsen, Barberton, and Chandrasekhara R. Kakarala, Clinton, both of Ohio, assignors to The Babcock & Wilcox Company, New York, N.Y.

Filed Jun. 30, 1977, Ser. No. 812,015
Int. Cl.[2] F28F 9/00
U.S. Cl. 165—70 4 Claims



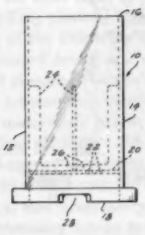
1. An heat exchanger comprising a shell, a closure on one end of said shell for establishing a gas space within the heat exchanger, a plurality of shrouds mounted within the heat exchanger, at least one of said shrouds extending from said shell and into said gas space, said shrouds being spaced from each other and from said shell, a plurality of separate tube bundles, each of said tube bundles being mounted within said shell and between said shrouds, a plurality of valves each of said individual valves selectively establishing fluid communication through a respective one of said tube bundles, at least two inlet nozzles penetrating the heat exchanger, each of said nozzles establishing separate fluid communication with the exterior of a respective one of said tube bundles, and a plurality of inlet nozzle valves, each of said valves selectively establishing fluid communication with said respective tube bundle exteriors.

4,163,471

FORCED CONVECTION HEAT EXCHANGER FOR WARMING ARTICLES

Frederic Leder, 1635 Reef View Cir., Corona Del Mar, Calif. 92625

Continuation-in-part of Ser. No. 728,470, Sep. 30, 1976, abandoned. This application May 1, 1978, Ser. No. 901,505
Int. Cl.[2] F28F 9/22, 9/24
U.S. Cl. 165—80 E 10 Claims



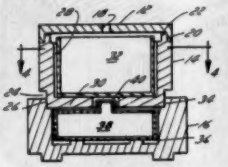
1. A forced convection heat exchanger for warming articles comprising a container having walls extending upwardly from a bottom end to define an open top end; a platform to receive and support a baby bottle mounted within the container spaced apart from the bottom end thereof; plurality of spacers extending inwardly from the walls to position the baby bottle within the container; a set of first drain openings extending through the platform, the area of the platform relative to the total cross-sectional area of the first drain openings providing a standing head of water under turbulent flow conditions within the container substantially up to the container open top end when the container receives an average flow of water from a tap; and, a second set of drain openings within the walls below the platform.

4,163,472

YOGURT MAKER

Frank Taylor, Vaudreuil sur le Lac, Canada, assignor to Michel Cogger, Montreal, Canada

Filed Jun. 22, 1977, Ser. No. 809,065
Int. Cl.[2] F28D 13/00; A23C 3/02, 9/12
U.S. Cl. 165—104 R 8 Claims



1. A yogurt maker comprising an insulated housing means, a fermentation compartment and a heat sink compartment formed in said housing means, a thermal barrier partition between said fermentation compartment and said heat sink compartment, aperture means in said thermal barrier portion to govern the rate of heat transfer from heat sink compartment to said fermentation compartment, means forming a heat sink in said heat sink compartment, means for thermally sealing said heat sink compartment, vent means for said fermentation compartment to provide the required air for fermentation to make yogurt in said fermentation compartment, said heat sink providing the sole source of thermal energy to maintain said fermentation compartment at fermentation temperature during said fermentation to make yogurt.

4,163,473

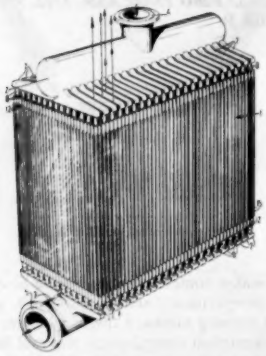
HEAT EXCHANGER

Gerhardus A. Engelberts, Breda, Netherlands, assignor to B.V. Machinefabriek "Breda" voorheen Backer en Rueb, Breda, Netherlands

Continuation of Ser. No. 640,765, Dec. 15, 1975. This application Sep. 2, 1977, Ser. No. 830,311
Claims priority, application Netherlands, Dec. 24, 1974, 7416886; Dec. 24, 1974, 7416887
Int. Cl.[2] F28F 9/02
U.S. Cl. 165—157 11 Claims

1. A heat exchanger comprising an elongated distribution header, an elongated collection header disposed parallel thereto, a plurality of tubes forming a tube bundle, and means for connecting said tube bundle to said headers, said connecting means comprising, a first group of relatively light and flexible elongated box-like distribution manifolds each connected at one end to said distribution header to extend outwardly from said distribution header and arranged in a linear array along one side of said distribution header with one manifold being spaced from an adjacent one by a distance substantially equal to the width of a manifold, a second group of relatively light and flexible elongated box-like distribution manifolds each connected at one end to said distribution header to extend outwardly from said distribution header in a direction opposite to that of said first group of manifolds and

arranged in a linear array along another side of said distribution header with one manifold being spaced from an adjacent one by a distance substantially equal to the width of a manifold, each distribution manifold being provided with a plurality of outlet ports disposed linearly along the side of the manifold adjacent to the end connected to the distribution header, a first group of relatively light and flexible elongated box-like collection manifolds each connected at one end to said collection header to extend outwardly from said collection header and arranged in a linear array along one side of said collection header with one manifold being spaced from an adjacent one by a distance substantially equal to the width of a manifold, a second group of relatively light and flexible elongated box-like collection manifolds each connected at one end to said collection header to extend outwardly from said collection header in a direction opposite to that of said first group of manifolds and arranged in a linear array along another side of said collection



header with one manifold being spaced from an adjacent one by a distance substantially equal to the width of a manifold, each collection manifold being spaced from and disposed opposite an associated distribution manifold and provided with a plurality of inlet ports disposed linearly along the side of the manifold adjacent to the end connected to the collection header and in alignment with the outlet ports in the oppositely disposed associated distribution manifold so that tubes of the tube bundle can be connected between each pair of opposite aligned ports of the distribution and collection manifolds, the arrangement being such that each pair of associated manifolds and the tubes connected thereto form a panel-like heat exchange unit containing only a small number of the tubes in the tube bundle and wherein the manifolds can flex when the tubes connected thereto expand or contract depending on the thermal conditions in that part of the heat exchanger, and an envelope surrounding the aforesaid elements of the heat exchanger for guiding a fluid medium around the tube bundle.

4,163,474

INTERNALLY FINNED TUBE

Robert D. MacDonald, Phoenix, Ariz.; Robert K. Rose, Burnt Hills, N.Y., and John W. Papsdorf, Lake Orion, Mich., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 665,465, Mar. 10, 1976, abandoned. This application Jun. 9, 1977, Ser. No. 805,063

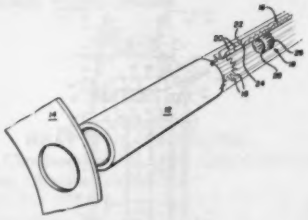
Int. Cl.[2] F28F *1/40*

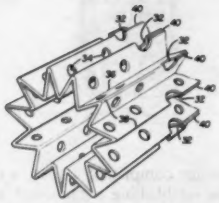
U.S. Cl. 165—179 **6 Claims**

1. An internally finned tube for use as part of a heat-exchanging system comprising:

an elongated cylindrical tube;

an array of fins in the form of a hollow integral sheet metal cylinder having V-shaped corrugations, with the corrugation ridges extending parallel to the axis of the tube when said cylinder is inserted in the tube, the outer ridges of said cylinder being in contact with the inner surface of the wall of said tube for substantially the full length of said outer ridges, the cylinder being severed along most but not all of the length of each of said outer ridges, the severence lines severing the outer radial ends of each fin from each other to define narrow clean-cut edges longitudinally extending with sharp corners for contact with the inner surface of the tube wall said sharp edges defining therebetween a





crevice area, one of either the cylinder or the inner surface of the tube wall being clad with a material having a melting point lower than that of either the base material of the tube or of the cylinder so that said sharp edges of the fins are brazed to the inner surface of the tube said sharp edges bonded into said cladding material, the unsevered portions maintaining said cylinder as an integral unit for insertion into the tube.

4,163,475

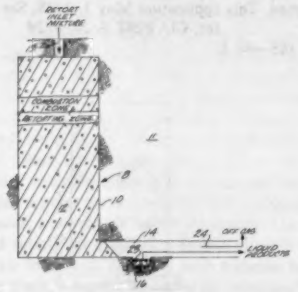
DETERMINING THE LOCUS OF A PROCESSING ZONE IN AN IN SITU OIL SHALE RETORT

Chang Y. Cha, Bakersfield, Calif., and William J. Bartel, Grand Junction, Colo., assignors to Occidental Oil Shale, Inc., Grand Junction, Colo.

Filed Apr. 21, 1978, Ser. No. 898,773

Int. Cl.[2] E21B *43/24, 47/00*

U.S. Cl. 166—251 **18 Claims**



17. A method for determining the locus of a processing zone in a fragmented mass in an in situ oil shale retort in a subterranean formation containing oil shale, the formation including a

plurality of generally horizontal strata of differing composition, the method comprising the steps of:

determining the value of a compositional variable of such formation at a plurality of elevations in an in situ oil shale retort;

predicting the value of a characteristic of shale oil from the fragmented mass as a function of the value of such a compositional variable of formation at said plurality of elevations in the fragmented mass;

advancing a processing zone through the fragmented mass for decomposing kerogen in oil shale to produce gaseous and liquid products including shale oil;

withdrawing liquid products including shale oil from a lower portion of the fragmented mass;

measuring values of said characteristic of shale oil withdrawn from the fragmented mass; and

correlating at least one measured value of the characteristic of shale oil with at least one predicted value of the characteristic of shale oil.

4,163,476

SECONDARY RECOVERY PROCESS UTILIZING AN ACRYLAMIDO ALKANESULFONIC ACID POLYMER

Jack F. Tate, Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

Continuation-in-part of Ser. No. 753,125, Dec. 22, 1976, abandoned. This application Feb. 13, 1978, Ser. No. 877,137

Int. Cl.[2] E21B *43/22, 43/27*

U.S. Cl. 166—271 **16 Claims**

1. A process for recovering hydrocarbons from a hydrocarbon-bearing formation containing acid-soluble components having at least one injection well and at least one production well penetrating the said formation and in fluid communication, which comprises displacing through the formation a composition comprising an acidic aqueous polymer solution and recovering hydrocarbons through the production well, the said acidic aqueous polymer solution comprising an aqueous solution of from about 2 to about 12 percent by weight of a mineral acid selected from the group consisting of hydrochloric, sulfuric acid and mixtures thereof and from about 1 to about 7 percent by weight of hydrofluoric acid and having dissolved therein from about 0.05 to about 5 percent by weight of an oxyalkylated acrylamido alkanesulfonic acid polymer.

4,163,477

METHOD AND APPARATUS FOR CLOSING UNDERWATER WELLS

John L. Johnson, and Billy W. Vanzant, both of San Antonio, Tex., assignors to Sub Sea Research & Development Corp., San Antonio, Tex.

Filed Mar. 2, 1978, Ser. No. 882,865

Int. Cl.[2] E21B *7/12*

U.S. Cl. 166—362 **10 Claims**

1. During cases of emergency on offshore drilling platforms, a method of shutting off flow from at least one underwater well to the offshore drilling platform from a remote underwater location consisting of the following steps:

positioning a well closure device at a wellhead of said well;

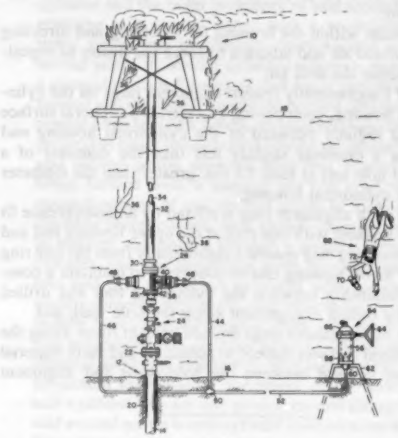
connecting said well closure device to an energy generating device by energy transmitting means;

providing a remote underwater location from said well and said offshore drilling platform with energizing apparatus connected to said energy generating device;

sending a diver to said remote underwater location upon said case of emergency, said diver carrying activation means for said energy generating device to said energizing apparatus;

activating said energy generating device by said activation means and energizing apparatus from said remote underwater location by said diver to generate energy;

communicating said energy via said energy transmitting means to said well closure device; and



closing of said well by said well closure device in response to said energy.

4,163,478

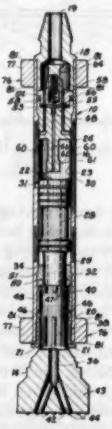
SELF ALIGNING IMPACT ROCK DRILLING TOOL

Gerald L. Adcock, 511 Airway Dr., Lewiston, Id. 83501

Filed Sep. 15, 1978, Ser. No. 942,605

Int. Cl.[2] E21B *7/04, 17/10*

U.S. Cl. 175—92 **5 Claims**



1. A self aligning downhole impact rock drilling tool adapted to receive a drill bit for forming a hole having a diameter of more than 7.5 cm. than the diameter of the tool, comprising:

an elongated cylindrical tool housing extending between an upper end and a lower end and having an outside diameter defining the tool diameter;

an internal pneumatic chamber within the housing;

a chuck at the lower end of the tool housing adapted to receive and securely mount a drill bit having an outside working diameter greater than 7.5 cm. of the diameter of the elongated tool housing and substantially equal to the hole diameter;

said upper end being adapted to operatively connect to an end of a drill string to receive pressurized air therefrom;

a piston within the pneumatic chamber adapted to strike the drill bit;

valve means within the housing for receiving and directing pressurized air and adapted to force the piston to repeatedly strike the drill bit;

a pair of longitudinally spaced alignment rings on the cylindrical housing, each having an exterior peripheral surface spaced radially outward of the cylindrical housing and having a diameter slightly less than the diameter of a drilled hole and at least 7.5 cm. greater than the diameter of the cylindrical housing;

wherein each alignment ring is affixed by an interference fit to the housing with one ring at the upper housing end and the remaining ring spaced longitudinally from the one ring at the lower housing end to cooperate to maintain a coaxial relationship between the cylindrical tool and drilled hole by sliding engagement along the hole wall; and

wherein the alignment rings include upright flutes along the peripheral surfaces thereof to permit air and earth material to pass upward between the hole walls and alignment rings.

4,163,479

NOISE ABSORBING DEVICE

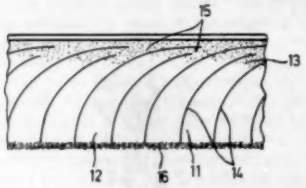
Oskar Bschorr, Munich, Fed. Rep. of Germany, assignor to Messerschmitt-Bolkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed Jun. 23, 1977, Ser. No. 809,173

Claims priority, application Fed. Rep. of Germany, Jul. 15, 1976, 2631812

Int. Cl.[2] E04B *1/99*

U.S. Cl. 181—286 **13 Claims**



1. A noise absorbing device having a given cut-off frequency with a wavelength λ comprising horn means including a plurality of horn members each having large cross sectional area mouth means and small cross sectional area neck means as well as tapering horn wall means interconnecting said mouth means and neck means, said horn means being adapted to face with said mouth means toward the noise, said horn wall means having a given straight length, said horn wall means further comprising means reducing the structural depth of said horn means, as compared to said given straight length, said structural depth reducing means comprising bends in said horn wall means, said bends being uniformly shaped so that said plurality of horn members may be nested one next to the other.

4,163,480

LINE TRAVELLING SKIPS

Stanley E. Highland, 316 Willington Ave., Chilliwack, British Columbia, Canada (V2P 2E4)

Filed Feb. 21, 1978, Ser. No. 879,035

Int. Cl.[2] B61B *7/06*; E01B *25/16*; E04G *3/10, 3/16*

U.S. Cl. 182—14 **34 Claims**

1. A line skip for carrying men on line means including one or more cables having obstructions thereon, such as spacers and hangers, comprising:

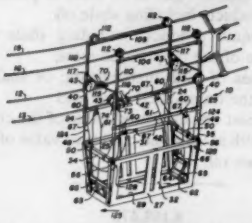
supporting means,

pulley means on said supporting means and adapted to ride on and be lifted off the line means when the skip is in use,

a carriage for carrying an operator,

connecting means interconnecting the supporting means and the carriage to carry said carriage below the line means at such a level that said operator can grasp and work around the line means, and

lifting means connected to the carriage operable to enable pulley means to be lifted off the line means and then replaced thereon so said lifted pulley means can be moved



past an obstruction on said line means, said lifting means comprising:

cable engager means to be placed on the line means adjacent the pulley means to be lifted,

extensible connector means connected to and extending between the cable engager means and the carrige, and

control means manipulatable by the operator in the carriage selectively to shorten and lengthen said connector means temporarily to take the weight of the carriage off said pulley means that is to be lifted off the line means.

4,163,481

RIM BRAKE FOR A BICYCLE

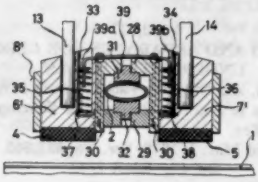
Robert Schoch, Singen, Fed. Rep. of Germany, assignor to Weinmann GmbH & Co. KG, Singen, Fed. Rep. of Germany

Filed Nov. 30, 1977, Ser. No. 855,991

Claims priority, application Fed. Rep. of Germany, Dec. 9, 1976, 2655699

Int. Cl.[2] B62L *1/10*

U.S. Cl. 188—24 **10 Claims**

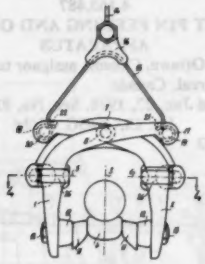


1. A cycle rim brake construction adapted for mounting on a cycle frame including a pair of frame members straddling a wheel having a rim, said construction comprising a casing having a chamber between its ends through which one of said frame members may extend; a pair of confronting clamp pads engageable on opposite sides of said one frame member and carried by said casing and accommodated in said chamber to permit relative rotation between said pads and casing about an axis substantially perpendicular to a plane defined by said rim; a pair of brake lining carriers; means for clamping said pads on said one frame member to thereby retain said casing in a position adjacent said rim; means mounting said carriers in said casing adjacent opposite ends of the latter and symmetrically of said axis for back and forth movements in directions substantially parallel to said axis toward and away from said rim; and actuating means carried by said casing for moving said carriers in a direction toward said rim.

4,163,482
CENTER-PULL CALLIPER BRAKES FOR BICYCLES AND THE LIKE

René Lauzier, Ruy, France, assignor to Angenieux CLB S.A., St. Etienne, France

Filed Feb. 28, 1978, Ser. No. 882,053
Claims priority, application France, Mar. 14, 1977, 77 08322
Int. Cl.[2] B62L *1/06*
U.S. Cl. 188—24 3 Claims

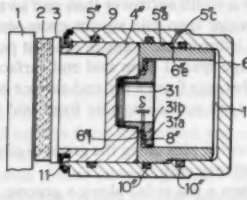


1. A vehicle having a frame; a wheel; and centre-pull calliper wheel brake comprising two callipers, and means mounting the callipers relative to the frame for pivotal movement about respective axes which are inclined with respect to the median plane of the wheel rim and intersect at a point situated in said median plane, wherein said two axes diverge with respect to one another along the direction of the forward movement of the wheel rim relative to the frame during rotation of said wheel.

4,163,483
AUTOMATIC CLEARANCE ADJUSTING MECHANISM IN A BRAKE

Takashi Baba, Toyota; Hiroshi Kawaguchi, and Kohji Nishikawa, both of Susono, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Continuation of Ser. No. 772,097, Feb. 25, 1977, abandoned.
This application Apr. 12, 1978, Ser. No. 895,649
Claims priority, application Japan, Mar. 1, 1976, 51-021898
Int. Cl.[2] F16D *65/54*
U.S. Cl. 188—71.8 1 Claim



1. An automatic clearance adjusting mechanism for a brake which is provided with a first piston fitted in a bore of a cylinder, a fluid chamber being defined by said first piston, said bore and a closed end of said cylinder, said first piston being slidable in said cylinder upon the application of fluid pressure into said chamber for urging a friction member onto a rotor member, comprising:

a second piston slidably fitted in said bore of said cylinder between said first piston and said closed end of said cylinder;

restricting means for limiting mutual separation beyond a predetermined distance between said first piston and said second piston;

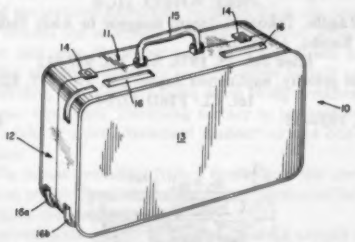
a spring disposed between said first piston and said second piston for biasing both into abutting engagement with one another; and

a frictional force generating means disposed between said cylinder and the outer periphery of said second piston for retaining said second piston with a predetermined frictional force, said mechanism characterized in that said second piston of annular cylindrical form is provided with a stepped portion formed on said outer peripheral surface thereof and the small diametered portion thereof is located remote from said first piston, an integral inwardly directed projection being formed on the inner peripheral surface of said second piston adjacent said first piston, said bore being formed with a stepped portion confronting said stepped portion of said second piston to form an annular chamber therebetween, said annular chamber being open to ambient atmosphere through a passage formed in said cylinder, and said restricting mean being a plug threaded into said first piston and provided with an integral outwardly directed projection, said outwardly direction projection being normally spaced from said inwardly direction projection by a distance equal to said predetermined distance and being engageable with said inwardly directed projection upon sliding movement of said first piston in said cylinder beyond said predetermined distance to slide said second piston is said cylinder relative to said frictional force generating means.

4,163,484
COMBINATION LUGGAGE PROTECTOR AND SPOTTER

John H. Delaney, 146-25 20th Rd., Whitestone, N.Y. 11357

Filed Apr. 18, 1978, Ser. No. 897,563
Int. Cl.[2] A45C *13/36*
U.S. Cl. 190—18 R 5 Claims



1. In combination with a luggage case of generally oblong shape having top, bottom, end and side walls meeting generally perpendicular to each other, a combination protector and spotter comprising a member having an elongated flat base portion and a rounded body portion of distinctive color, said body portion being composed of a resiliently deformable material, said base portion having a layer of contact adhesive thereon and a peelable strip of material covering said adhesive such that upon removal of said peelable strip, said luggage protector may be variably affixed to any part of one of said walls of said luggage case to protect said case from impact and to provide a source of identification of said case.

4,163,485
CONDUCTING RAIL HANGER CONSTRUCTION

Alleyne C. Howell, Jr., 645 Mine Hill Rd., Fairfield, Conn. 06430

Filed Feb. 28, 1978, Ser. No. 882,143
Int. Cl.[2] B60M *1/20*
U.S. Cl. 191—40 7 Claims

1. A rail construction, comprising in combination:

(a) an elongate conducting rail member,

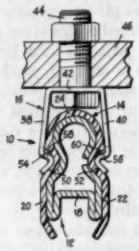
(b) an insulating sheath of channel-like cross section, jacket-

ing said rail member and having portions extending on opposite sides of said member,

(c) said sheath having oppositely disposed longitudinal groove formations, each providing a pair of facing shoulders,

(d) a spring clip of channel-like cross section,

(e) said clip having a web portion, and a pair of leg portions extending downward from the web portion,



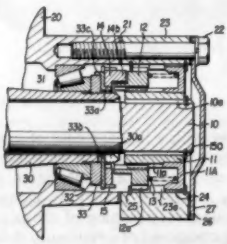
(f) said leg portions at their extremities having detent formations received in said groove formations, respectively, said detent formations being provided with shoulders that form camming surfaces, said detent formations further having cut, sharp edges intermediate the longitudinal ends of each leg portion and facing upward toward the web portion of the clip, for biting engagement with one shoulder of each pair of shoulders of the sheath, said biting engagement preventing said sheath from pulling out of said spring clip under the action of a transverse force.

4,163,486

FREE WHEEL HUB

Tooru Kagata, Takoaka, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Aichi, Japan

Filed Jul. 25, 1978, Ser. No. 927,911
Claims priority, application Japan, Jul. 27, 1977, 52-90630
Int. Cl.[2] F16D *13/04*
U.S. Cl. 192—35 **4 Claims**



1. A free wheel hub device comprising:

a main body secured to a wheel;

an inner race secured to a wheel axle and rotatably supporting said main body at an outer peripheral portion of said inner race;

a toothed wheel axially movably mounted on said inner race and having a cam face and outer teeth engageable with inner teeth of said main body;

a spring means disposed between said inner race and said toothed wheel for disengaging said toothed wheel from said inner teeth of said main body upon non-rotation of said wheel axle;

a support member secured to a wheel axle tube operatively connected to said wheel axle; and

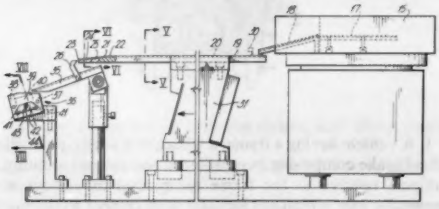
a shoe disposed between said toothed wheel and said support member and having a cam face for engaging with said cam face of said toothed wheel, said shoe being rotatable on a guide surface provided on said support member, whereby upon engagement of said cam faces of said toothed wheel and said shoe said outer teeth of said toothed wheel are engaged with said inner teeth of said main body by overcoming the force of said spring means to thereby slidably rotate said shoe upon said guide surface of said support member.

4,163,487

CONTACT PIN FEEDING AND ORIENTING APPARATUS

Jean M. Dupuis, Ottawa, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Jun. 27, 1978, Ser. No. 919,663
Int. Cl.[2] B65G *47/24*
U.S. Cl. 198—383 **10 Claims**



1. Apparatus for feeding and orienting contact pins, said pins having a square cross-section, a top end and a bottom end and including a swaged portion nearer said top end, said swaged portion including protrusions extending normal to each flat surface of the pin, the apparatus comprising:

a grooved feed member including a delivery end, the grooves at said delivery end each being of channel-shaped cross-section and having a base surface and substantially vertical side surfaces spaced apart a distance to permit said swaged portions to pass therebetween, a slot extending down through the feed members from the base surface of each groove, said slots extending from an end surface at said delivery end and each slot including a first portion extending from said end surface and a second portion extending from said first portion, said second portion having a length less than the length of the swaged portion of a pin and a width to pass said swaged portion, said first portion of a width narrower than said swaged portion of a pin and wider than said square cross-section of a pin to provide a ledge on each side of the first portion of the slot;

a support edge spaced from said end surface a distance less than the distance from a top end surface of a pin to an end of the swaged portion remote from said top end surface; and

means for feeding pins along the grooves of the feed member to said delivery end;

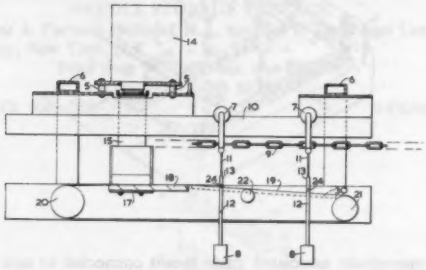
whereby when a pin is fed along a groove with its top end forward, the swaged portion is supported across said second portion of said slot to said first portion, said protrusions moving on said ledges, said top end feeding on to said support edge before said swaged portion leaves said end surface, continued feed movement moving said swaged portion off said end surface and said bottom end of said pin rotating down through said slot, said swaged portion rotating on said support edge, the bottom end falling first and followed by said top end, and whereby when a pin is fed along a groove with its bottom end forward, the bottom end falls down through the slot the swaged portion following through the second portion of the slot, so that in either feed orientation, a pin falls with its bottom end first.

4,163,488

CONVEYOR SYSTEMS

Richard M. Brook, Huddersfield, England, assignor to Auto Systems Limited, Waterloo, England

Continuation-in-part of Ser. No. 652,963, Jan. 28, 1976, abandoned. This application May 12, 1977, Ser. No. 796,095
Claims priority, application United Kingdom, Jun. 11, 1976, 24199/76
Int. Cl.[2] G01G *19/14*
U.S. Cl. 198—504 5 Claims



1. A conveyor system comprising:

(a) a plurality of article carriers;

(b) first conveyor means and a plurality of suspension means each securing one of said article carriers to said first conveyor means, said first conveyor means being arranged to convey said article carriers in succession in one direction along a predetermined path;

(c) electronic weight sensing means including a pair of spaced support members positioned at opposite sides, respectively, and adjacent to said path such that the succession of suspension means may pass therebetween with said article carriers therebelow;

(d) second conveyor means comprising a pair of spaced endless flexible members arranged for movement along opposite sides, respectively, of said path, the upper runs of said endless flexible members being adapted to move in the direction of movement of said article carriers and being inclined upwardly towards and passing over said pair of spaced support members of said weight sensing means;

(e) said first conveyor means being adapted to convey said suspension means with said article carriers between said pair of spaced endless flexible members and pair of spaced support members;

(f) each suspension means including means adapted to engage said upper runs of said endless flexible members as said suspension means moves along said path between said endless flexible members, whereby at least part of each suspension means and attached article carrier is elevated during passage between said endless flexible members by said inclined upper runs to a position where a load is applied to said pair of spaced support members, movement is imparted to said endless flexible members by said means adapted to engage the upper runs of said endless members such that said endless flexible members move at the same speed as said article carriers;

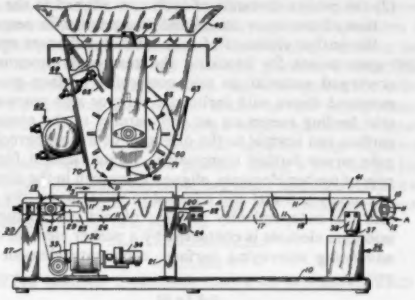
(g) said weight sensing means being arranged to emit a signal which is related to the total weight of said portion of each of said suspension means with attached article carrier and any article carried thereby.

4,163,489

FEEDER APPARATUS FOR FIBROUS MATERIALS

Eugene A. Wahl, 294 Forest Ave., Glen Ridge, N.J. 07028

Filed Aug. 21, 1974, Ser. No. 499,111
Int. Cl.[2] G01G *11/08*
U.S. Cl. 198—505 24 Claims



1. An apparatus for uniform bulk feeding of material onto a conveying belt having a conveying surface positioned beneath the apparatus, said apparatus comprising:

(a) A container member having substantially enclosed sides and an open top and bottom to facilitate the entrance and egress of material;

(b) vibrating means for providing a vibratory motion to the container;

(c) a rotating drum rotatably mounted inside said container to vibrate therewith and having its axis of rotation substantially parallel to the surface of said conveying belt, means for rotating said drum said drum having a multiplicity of projections extending outward form the drum surface thereof for receiving material deposited in said container and onto the upper portion of said drum and displacing said material from said container to said conveying surface, the surface of said drum being predetermined distance from said conveying surface to lay said material into a bed in a predetermined manner on said conveying surface;

(d) baffle means extending from a first side of the container, toward which the raking of the upper portion of the drum displaces the material; and

(e) a curved plate affixed to the bottom of a second side of said container member opposite said first side and having an edge positioned between said drum projections and said conveying surface;

(f) whereby material in the container passes between the baffle means and the rotating drum and thence downwardly between the drum and said first side, whereupon a quantity of the material is directed downwardly through said open bottom onto said conveying surface and excess material is raked by said projections over the lower edge of said curved plate and is carried by the projections back up between the drum and said curved plate into said container, the remainder of said material being removed by said conveying belt.

4,163,490

LOADING SEAL FOR INCLINED CONVEYOR

Ulrich Timm, Wauwatosa, Wis., assignor to Rexnord Inc., Milwaukee, Wis.

Filed Nov. 25, 1977, Ser. No. 855,094
Int. Cl.[2] B65G *47/19, 65/52*
U.S. Cl. 198—531 5 Claims

1. A seal and gate combination for sealing conveyed material against rearward movement on an upwardly operating inclined conveyor, comprising:

(a) a conveying surface for support and transport of the

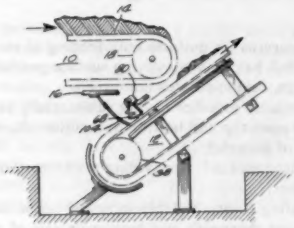
conveyed material and being positioned to receive discharge of conveyed material from a feeding means;

(b) pusher means attached to said conveying surface and extending outwardly therefrom for urging the conveyed material up said inclined conveyor, said pusher means further comprising,

(1) at least two rows of pusher elements, and,

(2) the pusher elements of each row aligned in the direction of conveyor travel and staggered with respect to the pusher elements of each laterally adjacent row;

(c) gate means for blocking the rearward movement of conveyed material on said conveying surface pivotally mounted above said inclined conveyor and rearward of said feeding means on an axis parallel to the conveying surface and normal to the direction of travel thereof, said gate means further comprising, a gate element for each row of pusher elements, aligned therewith in the direction of conveyor travel and adapted to rotate upwardly about said axis independently of other of said gate elements as said gate element is contacted by a pusher element on the advancing conveying surface, each gate element comprises,



(1) a generally rectangular plate having a lower edge parallel to its axis of rotation and lying closely spaced from the conveying surface;

(2) a gate flange attached to each plate at a lateral edge thereof adjacent the gate element of each laterally adjacent row;

(3) each gate flange extending rearwardly from said plate and perpendicular thereto and having the shape of a circular segment with its center on the axis of rotation of said gate means; and

(4) the lower edge of said flange having a radius approximately equal to the radius of the arc defined by the lower edge of the plate as it pivots about the axis of rotation,

(d) seal means positioned behind said gate means and depending from above the conveying surface for further blocking the rearward movement of conveyed material on the conveying surface, said seal means further comprising, a flexible seal segment for each row of pusher elements, aligned therewith and with the gate element for said row and adapted to bend upwardly and away from the conveying surface as said seal segment is contacted by a pusher element.

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WOOD VENEER CLIPPER INFEED CONVEYOR RETRACTABLE HOLDDOWN MECHANISM

Vincent M. Rock, Issaquah, and Arne R. Severinsen, Seattle, both of Wash., assignors to Elliott Bay Plywood Machines Co., Seattle, Wash.

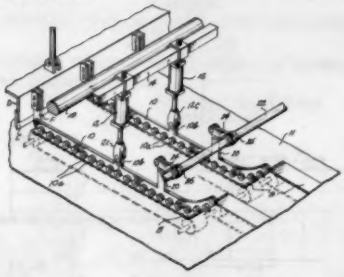
Filed Jun. 29, 1977, Ser. No. 811,323

Int. Cl.[2] B65G *15/00*

U.S. Cl. 198—836 **10 Claims**

1. In combination with belt conveyor means operable to support and feed wood veneer in a generally horizontal plane through a veneer clipper, a plurality of elongated transversely spaced veneer holddown bars mounted above the conveyor means in parallel relationship in positions abreast of each other to engage and flatten the veneer under conveyance as it enters the clipper,

yieldable reversible actuator means operatively connected to the respective bars intermediate the ends thereof and selectively operable to move the bars into such holddown engagement with the veneer and retractively therefrom in paths lying in parallel vertical planes extending in the direction of feed, and when in such holddown engagement with the veneer to urge such bars yieldably against the veneer, and



operatively associated guide means connected to said bars further controlling such motion of the bars to include a vertical component of motion and also a component of motion parallel to the direction of veneer feed, the latter component of motion during bar retraction being directed opposite the direction of veneer feed,

said actuator means and guide means cooperatively programming the retraction motion of the bars with the trailing ends thereof adjacent the clipper substantially executing the vertical component of retraction before the opposite or leading ends of such bars undergo substantial retraction motion.

4,163,492

SAFETY PACKAGE OF TOOTHPICK HOLDER

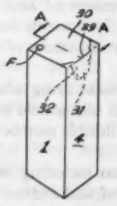
Hermogenes Rella, Itatiba, Brazil, assignor to A. Rela s/a Industria e Comercio, Sao Paulo, Brazil

Filed Mar. 7, 1978, Ser. No. 884,283

Claims priority, application Brazil, Oct. 21, 1977, 7707080

Int. Cl.[2] B65D *83/02, 85/24*

U.S. Cl. 206—380 **9 Claims**



1. A safety package for holding and dispensing toothpicks in a sanitary manner, said package comprising:

(a) a plurality of sides and a gluing edge attached to one of said sides, said sides and said gluing edge being formed by a series of creases in a single piece of material;

(b) a plurality of bottom edges attached to said sides which overlay one another to form a bottom of said package, said bottom edges being formed by a series of creases in said single piece of material; and

(c) a plurality of cover edges attached to said sides which overlay one another to form a cover of said package, said cover edges being formed by a series of creases in said single piece of material and having a plurality of grooves

and a hole for providing individual output of toothpicks, wherein said cover edges further comprise:

(i) a first cover edge including a trapezoidal projection thereon having a plurality of ears which are foldable with respect to said projection, said projection and said ears being formed by a series of creases in said single piece of material; and

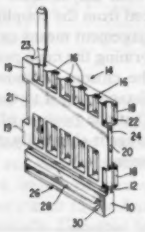
(ii) a second cover edge having a slit therein for receiving said trapezoidal projection and folded ears when said edges are overlaid whereby said cover edges are locked in place.

4,163,493

NEEDLE STORAGE PACKAGE

Wayne A. Current, Holmdel, N.J., assignor to The Singer Company, New York, N.Y.

Filed Aug. 31, 1978, Ser. No. 938,281
Int. Cl.² B65D *85/24*
U.S. Cl. 206—380 **4 Claims**



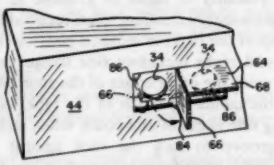
1. A needle storage package for sewing machine needles having a storage sector formed with opposite side edges; a base formed with front and rear surfaces; and a flexible hinge connecting said storage sector to said base; said storage sector having at least one storage compartment formed therein for the storage of sewing machine needles; said at least one storage compartment frictionally receiving and storing in a vertical position one sewing machine needle; first complemental interengaging means arranged along opposite side edges of each of said needle storage packages for connecting two of said needle storage packages together side by side; and second complemental interlocking means arranged on the front and rear surfaces of the base of each said needle storage packages for connecting two of said needle storage packages together front-to-back.

4,163,494

SHIPPING CONTAINER

Ray H. Stollberg, Gilroy, Calif., assignor to Crown Zellerbach Corporation, San Francisco, Calif.

Filed May 15, 1978, Ser. No. 906,190
Int. Cl.² B65D *85/50*
U.S. Cl. 206—423 **6 Claims**



1. A shipping container for cut flowers and the like comprising:

a tray including a bottom wall and a plurality of tray side walls extending from said bottom wall, at least one of said tray side walls having an aperture formed therein;

a cover for placement on said tray, said cover including a top wall and depending cover side walls, at least one of said cover side walls having an aperture formed therein, said apertures being in registry when said cover is placed on said tray, said cover additionally including closure means manually movable between a first position whereat communication is established through said apertures in registry between the interior of the shipping container and ambient atmosphere and a second position whereat said communication is interrupted, and lock means for selectively retaining said closure means in said first position, said closure means comprising a hingedly secured closure flap having first and second adjacent flap segments hingedly secured to one another along a first hinge line and said flap segments being angularly disposed relative to one another about said first hinge line when said closure means is in said first position.

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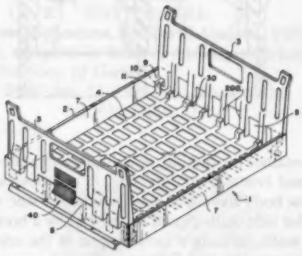
PLASTIC BREAD CARRIER HAVING FOLDING END WALLS

Clarence H. Drader, R.R. #2, Sherwood Park, Alberta, Canada

Filed Sep. 21, 1977, Ser. No. 835,217
[30] Foreign Priority Application Data
Sept., 1976 [GB] United Kingdom 39928/76
Int. Cl.² B65D *21/02, 7/26;* A47G *23/06*
U.S. Cl. 206—506 **2 Claims**



1. A plastic carrier for bread and the like comprising:

a rectangular tray having a floor section and a pair of end rails upstanding from the floor section;

a pair of end walls connected with the tray for rotation, between a generally horizontal position overlying the floor section and a generally vertical position wherein they are disposed above the end rails, and for limited vertical movement, whereby the end walls may be shifted downward when generally vertical onto the end rails, to form upwardly projecting extensions of said end rails, or upward off the end rails;

each said end wall having a lower edge portion comprising spaced apart downwardly extending parallel inner and outer leg portions which form a first groove extending along at least the greatest part of said end wall's length, said first groove corresponding to the thickness of the upper edge portion of the adjacent end rail whereby, when the end wall is rotated to the generally vertical position and moved downward, the leg portions may drop down over and engage the upper edge portion of the end rail, to restrain the end wall from rotating back inward toward the floor section;

said floor section forming a second groove, disposed across the greatest part of its width adjacent the base of each end rail, for receiving the inner leg portion of the relevant end wall when the end wall has been rotated to the generally vertical position and moved downward to penetrate said second groove, a side wall of said second groove being operative to restrain the end wall from rotating further outward substantially beyond vertical; and

releasable means for restraining upward movement of the

end walls relative to the tray when said end walls are in the downwardly shifted position;

said releasable means comprising outer leg portions which are progressively longer toward the midsection of the end wall, whereby as each end wall is rotated upwardly, the midsection portion of the outer leg portion is first to engage the upper edge portion of the end rail, thereby causing the end rail to bow downwards as the end wall is further rotated to a generally vertical position, at which point the end rail automatically penetrates into the first groove.

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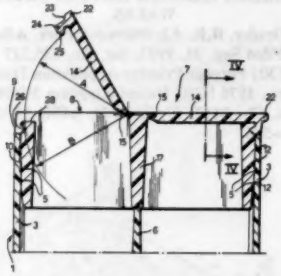
CONTAINER FOR DISPENSING SMALL OBJECTS

Amilcare Dogliotti, Alba, Italy, assignor to P. Ferrero & C. S.p.A., Alba, Italy

Filed Sep. 30, 1977, Ser. No. 838,176
Claims priority, application Italy, Oct. 4, 1976, 69380 A/76
Int. Cl.[2] B65D *85/60, 43/16*
U.S. Cl. 206—538 **18 Claims**



1. A container for holding and dispensing a plurality of small objects, said container comprising, in combination:

a hollow body having at least two larger side walls and two smaller side walls closed at one end by a bottom wall, said side walls defining a mouth open at the end of said container opposite said bottom wall;

a hollow closure element of plastics material having a cross sectional shape substantially the same as that of said hollow body, said hollow closure element having a main part in the form of a skirt the sides of which define at least one aperture passing through said closure element from top to bottom, said closure element being shaped such that it can be assembled to said hollow body of said container to close said mouth thereof;

a tongue for the closure of said at least one aperture of said closure element, said tongue being formed integrally with said closure element, and a portion of said tongue being of reduced section with respect to the main part of said tongue and serving as a hinge joining said tongue to said main part of said closure element; said tongue being in the form of a plate having plane parallel faces and said portion of reduced cross section constituting said integral hinge being defined by a first transverse notch, v-shaped in cross section, formed in the lower surface of said tongue, and a second transverse notch formed in the upper surface of said tongue at a position opposite said first notch; said second notch having a depth and width substantially less than that of said first notch;

means defining a seat on said closure element adapted to receive the free end of said tongue remote from said hinge in the closure position of said tongue;

a projecting part of said free end of said tongue extending beyond said seat of said closure element and providing means for engagement by the thumb of a user in opening said container;

a transverse ridge projecting from the under surface of and spaced inwardly from said free end of said tongue and extending in a direction parallel to said hinging axis of said tongue;

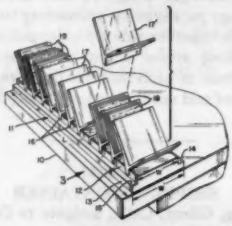
means defining cooperating snap engagement means, one part of which is carried by the outer surface of said skirt defining said main part of said closure element adjacent said seat, and the other part of which is carried by said transverse ridge projecting from said free end of said tongue, for retaining said tongue in its closure position, said tongue and said transverse ridge together constituting a rigid element which is sufficiently stiff not to be deformed by forces applied to said projecting part of said tongue during the operations of opening and closing said container such that, during such operations, said portion of reduced cross section of said tongue constituting the hinge thereof reacts elastically in the manner of a spring to displacing forces applied to said tongue by said snap engagement means, said hinging axis of said tongue being spaced from the coupling surface of said snap engagement means carried by said transverse ridge on said tongue a distance less than the distance said hinging axis of said tongue is spaced from the coupling surface of said cooperating snap engagement means carried by the outer surface of said skirt forming the main part of said closure element, whereby in the closure position of said tongue it is displaced by a distance equal to the difference between said distances so that the portion of said tongue constituting said integral hinge is elastically stretched to accommodate such displacement.

4,163,497

PHARMACIST'S PRESCRIPTION FILE HOLDER

William D. McEwen, 727 Viewcrest Dr., Ventura, Calif. 93003

Filed May 9, 1978, Ser. No. 904,326
Int. Cl.[2] B42F *17/12*
U.S. Cl. 211—11 **5 Claims**



1. A pharmacist's prescription file holder comprising, in combination:

(a) an elongated board having a plurality of transverse grooves cut into its top surface; and

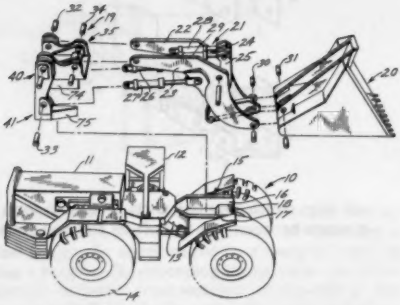
(b) a plurality of racks of L-shape in cross section with downwardly extending stems receivable in said grooves to support the racks in inclined positions on said board, each of said racks including side flanges integrally extending between the outer edges of the stem and lower side edges of the inclined portion of the rack, said flanges overlapping side edges of said board when said stem is received in a groove to lock the rack against lateral movement, whereby identifying information constituting the top few lines on prescription files placed in said racks is clearly visible to a pharmacist at all times so that a desired prescription file can readily be located when stored in said holder.

4,163,498

TOWER ASSEMBLY

Frank A. Grooss, Morton, and Gerald P. Simmons, Washington, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Dec. 13, 1977, Ser. No. 859,364
Int. Cl.[2] E02F 3/70
U.S. Cl. 414—697 9 Claims



1. In a wheeled vehicle having a frame provided with laterally spaced front rail portions each defining a side and a top, a working component, and arm and control cylinder means attached to the working component for selective positioning of the working component, improved means for mounting said arm and control cylinder means to the frame comprising:

a prefabricated substantially U-shaped tower assembly having lower portions laterally adjacent said spaced rail portion sides and an upper portion overlying the space between said rail portions and supported on said tops thereof;

means removably pivotally connecting said arm and control cylinder means to the tower assembly; and

securing means fixedly securing said tower assembly lower portions to said sides of said spaced rail portions, and said tower assembly upper portion to said tops of said spaced rail portions.

4,163,499

CASSETTE UNLOADER

Gunter Schmidt, Malibu, Calif., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 13, 1977, Ser. No. 805,816
Int. Cl.[2] B65G 65/04
U.S. Cl. 414—411 7 Claims

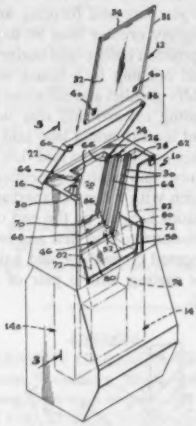
1. An unloader for an X-ray film-holding cassette which has a pair of walls pivotally joined at one end and held together at the other end by at least one latch which can be pushed in to release the walls so they can pivot apart, said unloader comprising:

a lighttight housing;

guide means for slidably receiving one wall of said cassette in said housing and holding it inclined at an acute angle to the vertical;

a release member fixedly positioned in said housing to engage the latch on a cassette received by said guide means, whereby to release the other wall for swinging movement to an open position; and

a retainer in the path of a cassette received by said guide means biased to hold said cassette out of engagement with said release member until said cassette is pushed against



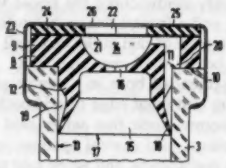
the bias of said retainer, and, means to move said cassette against said retainer.

4,163,500

BOTTLE SEAL

Ingemar Gunne, Sollentuna, and Bertil Almgren, Viillingby, both of Sweden, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jan. 23, 1978, Ser. No. 871,536
Int. Cl.[2] B65D 51/16
U.S. Cl. 215—260 3 Claims



1. In a bottle seal for a necked bottle including a resilient stopper having an extending portion adapted to be inserted into the neck of a bottle in circumferential sealing engagement with the inner diameter wall of the bottle neck, the stopper being provided with a concentric slit area for sealing receipt of a liquid withdrawing needle, the improvement of the terminating in a lip seal engageable with the inner diameter wall of the bottle neck, a circumferential groove adjacent the lip in an outer diameter of the extension and an air channel communicating the groove with a portion of the stopper on an exterior side of the slit area remote from the lip seal.

4,163,501

ELECTRICAL OUTLET BOX AND WALL MOUNTING CLAMP THEREFOR

John L. Lass, Homewood, Ill., assignor to Square D Company, Park Ridge, Ill.

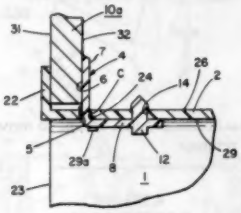
Continuation of Ser. No. 837,955, Sep. 29, 1977, abandoned. This application Jun. 6, 1978, Ser. No. 913,178
Int. Cl.[2] H02G 3/08
U.S. Cl. 220—3.6 4 Claims

1. A clamp for use with an electrical outlet box, said clamp receivably located in an elongated slot in a wall of said outlet box, said clamp comprising;

a first leg outside of said outlet box and a second leg inside of said outlet box, said second leg consisting of a pair of spaced apart projections, said first and second legs being connected at a juncture and forming an initial predetermined angle slightly greater than 90 degrees, said clamp being in a first position before said outlet box is installed in a predetermined opening in a house wall, said first leg being substantially parallel and adjacent to said outlet box wall and extending toward said rear wall of said outlet box, said second leg extending into said outlet box,

a central appendage connected to said first leg of said clamp near said juncture, said central appendage having a step-down end portion with a central aperture,

a pair of snap buttons located on the end of said second leg opposite said juncture of said first and second legs, a snap button being located on each of said pair of spaced apart projections, for mating with a pair of apertures in said outlet box wall,



such that after said outlet box is positioned in the predetermined opening in the house wall, said clamp is manually moved to a second position by pivoting said first and second legs about said juncture in said elongated slot until said snap buttons on said second leg are located in said corresponding apertures in said outlet box wall, said first leg effectively sandwiching the house wall between said second leg and a frontal flange, extending laterally away from a front edge of said outlet box wall, thereby securing said outlet box in the house wall, and

an internally threaded bore in a center post extending inwardly from said front edge of said outlet box wall and a mounting screw, such that when said clamp is in said second position, said central aperture and said threaded bore are in registration, and when said mounting screw is inserted in said threaded bore, said mounting screw extends through said central aperture of said step-down portion of said central appendage thereby substantially retaining said clamp in said second position.

4,163,502

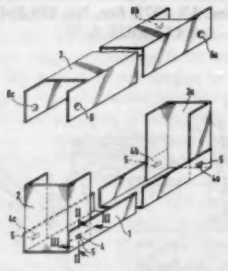
SHEET METAL CONNECTION IN ELONGATED LAMP HOUSINGS

Heinrich Korte, 60 Grosswolder Strasse, Ihrhove, Fed. Rep. of Germany (2951)

Filed Dec. 27, 1977, Ser. No. 864,969
Int. Cl.[2] H02G *3/08*; B65D *7/00*
U.S. Cl. 220—3.94 **4 Claims**

1. In an elongated fluorescent lamp housing made of assembled sheet metal parts of the type including a prelacquered elongated, generally U-shaped lamp element, two prelacquered, generally U-shaped front faces joined to opposite ends of the lamps element and a generally U-shaped, elongated covering hood joined to the front faces and the lamp element, the improvement comprising:

at least said front faces and said lamp element being provided with overlapping and abutting surfaces defining connecting zones, said front faces and said lamp element in said connecting zones having simultaneously-formed coacting indentations formed therein from one side of the connecting zone, for joining said front faces and lamp element rigidly together, said coacting indentations of said lamp element and said front faces each forming an unlacquered



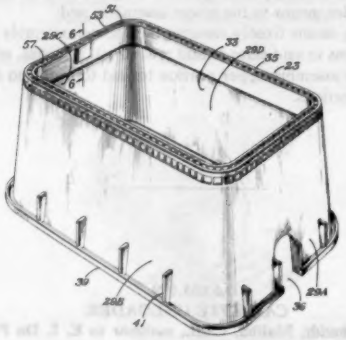
cut edge which abut one another so as to form electrical contacts between said front faces and said lamp element.

4,163,503

LID AND HOUSING

Robert M. McKinnon, Bedford, Tex., assignor to D/FW Plastics, Inc., Bedford, Tex.

Filed Sep. 20, 1978, Ser. No. 944,074
Int. Cl.[2] B65D *25/24*
U.S. Cl. 220—18 **6 Claims**



3. A housing for installation in the ground, comprising:

upstanding wall means formed of plastic material defining a cavity having an upper opening and a bottom opening,

said upper opening being generally rectangular in shape and formed by surrounding upper wall structure having an upper edge for supporting a lid,

said upper wall structure comprising an inner ridge and an outer ridge which surround said upper opening,

said inner and outer ridges being joined together at a position located below said upper edge and extend away from each other in an upward direction,

the top edges of said inner and outer ridges being spaced apart from each other, and

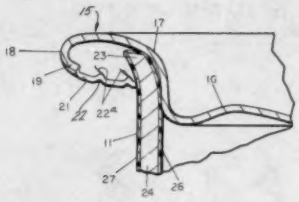
a plurality of ribs extending between said inner and outer ridges at spaced apart positions, the top edges of said inner and outer ridges and of said ribs defining said upper edge of said housing.

4,163,504

METAL END HAVING FLUTED END CURL

William F. Elser, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Dec. 8, 1977, Ser. No. 858,772
Int. Cl.[2] B65D 7/42, 3/10
U.S. Cl. 220—66 10 Claims



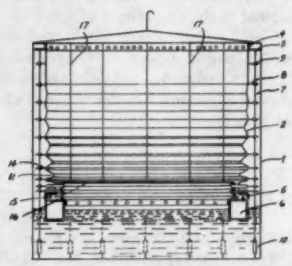
1. A loose metal can end for use in forming a seamed can end closure for a can body, said loose metal can end including a central panel marginally encompassed by a marginal seaming panel having a peripherally depending curled outer rim defining a convexly radiused cross-sectional configuration and concluding in a radially inwardly curled end, said curled end including means preformed therein for inducing said curled end to pinwrinkle directionally away from said can body when said loose metal can end is subsequently seamed onto the end thereof, said means comprising a peripherally interspaced array of flutes respectively cresting directionally towards the interior confines of said outer rim, and said curled end with the exception of said flutes being otherwise essentially smoothly surfaced throughout the peripheral entirety thereof.

4,163,505

FOLDABLE LINERS FOR FLUIDS HOLDING STORAGE TANKS

Arnold Gunther, 29 Lorelei Rd., West Orange, N.J. 07052

Filed Sep. 23, 1977, Ser. No. 836,034
Int. Cl.[2] B65D 89/04, 89/16
U.S. Cl. 220—85 B 5 Claims



1. A device for folding vertical liners with a polyhedral shape comprising, in combination,

a. a liquid holding storage tank with a frame welded to the inner top portion of said tank's shell, the inner face of said frame being a vertical surface prismatically shaped and substantially concentrical with the tank's shell, the distance between said inner face and said shell being substantially a small fraction of the said shell's diameter,

b. a freely moving, substantially rigid frame, located inside the tank and free to displace in the vertical direction, the inner surface of this frame having a vertical prismatical shape substantially identical to the said welded frame,

c. a vertical liner, concentrically located to the said tank's shell, its top portion attached to the inner face of said welded frame, its bottom portion attached to the inner face of the said freely moving frame, the vertical liner taking the shape of a polyhedrical surface with a number of faces equal to the number of faces of each of said frames,

d. a plurality of vertical cables having their top portions attached to the said welded frame and their bottom portions attached to said tank's floor, the cables being located between the said vertical liner and the said tank's shell and facing said liner's vertical edges, the number of cables being equal to the number of said vertical edges,

e. a plurality of strips with one of their ends attached to the edges of said vertical liner, their other end being traversed by said vertical cables and free to slide over said cables, said strips being located in a plurality of horizontal plans, said strips cooperating with said freely moving frame to fold said vertical liner for an upward displacement of said frame and to unfold said liner for a downward displacement of said frame,

f. means to induce vertical motions in the said freely moving rigid frame.

4,163,506

CLOSURE ASSEMBLY HAVING A TEAR TEMPLATE

Richard A. Patterson, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 23, 1978, Ser. No. 953,883
Int. Cl.[2] B65D 41/02
U.S. Cl. 220—260 16 Claims

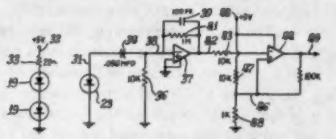
1. In a hand operable easy opening closure system of the type wherein a flexible exterior tape and an interior sheet material are employed to removably seal a preformed opening in an end portion of a container, the improvement which comprises a flexible tear template, said template having a top surface and a bottom surface, said top surface being bonded to the underside of said exterior tape and said bottom surface being bonded to the top of said interior sheet material in the area of said preformed opening and being capable of removing the portion of said interior sheet material in the area of said pour hole and tearing an opening of predetermined shape in said exterior tape when said closure system is opened.

4,163,507

OPTICAL SEED SENSOR FOR A SEED PLANTER MONITOR

Dennis M. Bell, Hudson, Ill., assignor to International Tapetronics Corporation, Bloomington, Ill.

Filed Mar. 20, 1978, Ser. No. 888,398
Int. Cl.[2] B65B 57/18
U.S. Cl. 221—2 5 Claims



1. For use with a seed monitor for a seed planter having a chute for periodically dispensing seeds, an optical seed sensor comprising:

a light emitting diode means and a rapidly-responding solar cell light receiving means mounted in opposing relationship in the chute for seed passage therebetween;

a light shield having a slit narrower than the diameter of a seed, said shield being disposed within the chute adjacent

to said solar cell means and interiorly thereof with said slit being transverse to the path of a seed dispensed through the chute;

said solar cell light receiving means being operable to generate a voltage output in response to the presence of light emitted from said diode means, the passage of a dispensed seed between said diode means and said solar cell means serving to temporarily reduce the intensity of the light passing through said slit to said solar cell means to temporarily reduce said voltage output thereof;

a differentiator circuit means and a comparator circuit means connected in series with said solar cell means output, said differentiator circuit means being operable to provide an output voltage proportional to the change of said solar cell means output with respect to time, and said comparator circuit means being operable to provide a counting pulse whenever the voltage output of said differentiator circuit means exceeds a predetermined threshold voltage value;

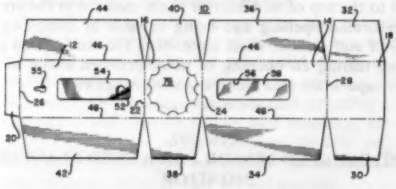
whereby said light shield limits the intensity of the light received by said rapidly-responding solar cell means for discrimination between closely spaced or partially overlapping seeds dispensed through the chutes.

4,163,508

DISPOSABLE CUP DISPENSER

Arden Mannor, Tatum, Tex., assignor to Carthage Cup Company, Carthage, Tex.

Filed Jun. 13, 1977, Ser. No. 805,740
Int. Cl.[2] B65D *5/16*
U.S. Cl. 221—310 **5 Claims**



1. A carton formed from a blank of flexible sheet material which is pre-cut and scored to define panel and closure portions thereby permitting the blank to be folded and erected into a tubular carton for enclosing a nested stack of cups of the type having a rolled edge and a tapered sidewall body section, the one-piece blank including a pair of longitudinal side panels and a dispensing end panel interconnecting the side panels, the dispensing end panel having pre-cut portions and perforations which delineate a tear line forming the boundary of a dispensing opening, the portion of the end panel circumscribed by the tear line being removable to permit the withdrawal of a cup from a nested stack of cups enclosed within the carton, the dispensing opening being characterized by a substantially circular edge interrupted by a plurality of radially projecting tabs which are circumferentially spaced relative to each other around the periphery of the dispensing opening, the diameter of the circular edge being substantially equal to the outside diameter of the rolled edge of the cup, and the diameter as measured between radially opposite tabs being substantially equal to the outside diameter of the tapered sidewall body portion of the cup which is joined to the rolled edge.

4,163,509

SQUEEZE DISPENSER WITH SELF CLOSING VALVE

John S. Amneus, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 836,117, Sep. 23, 1977, abandoned, said Ser. No. , is a continuation-in-part of Ser. No. 770,533, Feb. 22, 1977, abandoned. This application Mar. 23, 1978, Ser. No. 889,460
Int. Cl.[2] B65D *35/08, 35/52*
U.S. Cl. 222—95 **12 Claims**

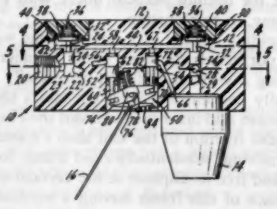
1. In a dispensing container for fluids comprising a body and a discharge spout which projects outwardly therefrom and wherein said spout comprises opposing walls of supple imperforate material interconnected at their lateral edges by seams which dispose the walls in substantially face-to-face contact when the spout is empty, the improvement which comprises: a valve portion of said spout in which said seams maintain said walls in a curled conformation in the discharge direction when empty to thereby provide a valving action, said walls at least in said valve portion comprising separate layers of said material, each of said layers having a radius of curvature with an axis generally normal to the centerlines of the walls of said spout when empty, said seams in said valve portion comprising a union of said separate layers in substantially face-to-face contact with one another, whereby the radius of curvature of one of said layers is greater than the radius of curvature of the other of said layers.

4,163,510

METHOD OF AND APPARATUS FOR DISPENSING A MULTI-CONSTITUENT BEVERAGE

Marshall C. Strenger, 450 Thorne, Lake Forest, Ill. 60045

Filed Aug. 12, 1977, Ser. No. 824,076
Int. Cl.[2] B67D *5/56*
U.S. Cl. 222—129.2 **29 Claims**



1. A method of dispensing a mixed beverage constituting measured quantities of a base liquid and a flavoring constituent wherein a controlled flow of base liquid and a controlled flow of flavoring constituent are selectively directed to a beverage

outlet and thereafter expelled from the outlet into a suitable container, the method comprising the steps of:

a. selectively and manually actuating a pilot flow of base liquid under pressure;

b. introducing said pilot flow into each of a plurality of flow valves, one each associated with independent sources of base liquid and flavoring constituent, for independently activating a flow of base liquid and a flow of flavoring constituent to the beverage outlet; and

c. deactivating said pilot flow for inhibiting the flow of base liquid and flavoring constituent to the beverage outlet.

4,163,511

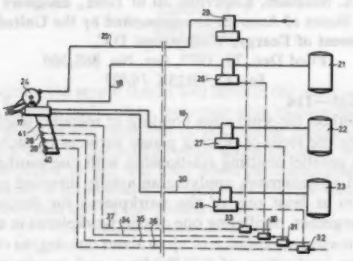
DISPENSER HAVING MANUALLY OPERATED AIR CONTROLLED VALVES

Geza Kecskeméthy; György Virág; Robert Tihanyi, all of Budapest, and Zoltán Czirmai, Tatabanya, all of Hungary, assignors to Muanyagipari Kutato Intezet, Budapest, Hungary

Filed May 9, 1977, Ser. No. 795,234

Int. Cl.[2] B67D *5/60*

U.S. Cl. 222—144.5 **2 Claims**



1. In an apparatus for dispensing material, comprising a hand-held dispenser connected by at least one flexible conduit to plural sources of material under pressure to be dispensed, and valve means for selectively opening and closing said conduit to the flow of said material therethrough, said valve means being disposed in series between said flexible conduit and said sources, and means carried by said dispenser for selectively actuating said valve means; the improvement in which said actuating means comprises orifices on said dispenser that may be selectively opened or closed by the operator, small conduits interconnecting said orifices with a source of air under pressure, one said conduit being individual to each said orifice for the separate control of the flow of at least one said material to said dispenser, and means responsive to a change in pressure in any said small conduit upon opening or closing the associated one of said orifices, to actuate said valve means, said dispenser comprising a spray gun having a handle, said orifices opening through the surface of said handle.

4,163,512

SINGLE USE POURING SPOUT AND COMBINATION

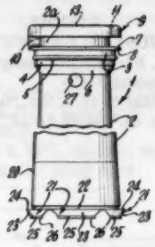
Davis B. Dwinell, Warren, N.J., assignor to American Flange & Manufacturing Co. Inc., Linden, N.J.

Filed Sep. 9, 1977, Ser. No. 831,993

Int. Cl.[2] B65D *25/44*

U.S. Cl. 222—525 **7 Claims**

1. A one-piece pull-up pouring spout integrally molded of synthetic plastic material for displacement between a lowered container sealing position and raised pouring position comprising an elongated tubular body having a smooth interior surface free of internal projections, said spout having a closed upper end portion and an open lower end portion, a first selfsupported sealing surface disposed about the upper end portion of said spout tubular body dimensioned for tight sealing engagement within a container wall opening with said spout in lowered sealing position whereby said one-piece spout acts as the



sole means for closing off the container wall opening, a second sealing surface disposed about the lower end portion of said spout for sealing engagement within a container wall opening with said spout in raised pouring position, and gripping means integrally connected to said spout for pulling said spout from said lowered sealing engagement and raising said spout from a lowered container sealing position to an extended position.

4,163,513

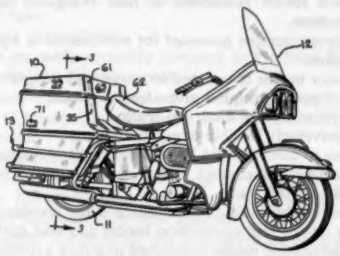
MOTORCYCLE SADDLEBOX

Ralph Kramer, 2628 Powhattan Pkwy., Toledo, Ohio 43606

Filed May 16, 1977, Ser. No. 797,507

Int. Cl.[2] B62J *9/00*

U.S. Cl. 224—32 R **2 Claims**



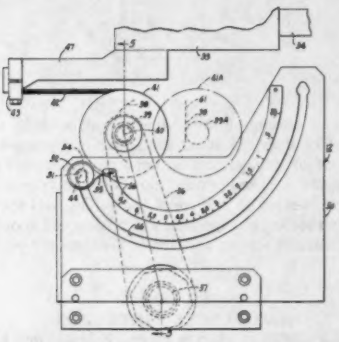
1. A saddlebox for motorcycles and the like; said saddlebox comprising a rigid, hollow container including outermost front, rear and side walls joined at their intersections to provide a closed outermost periphery and a bottom plate intersecting and joined to said walls; a pair of spaced apart innermost side walls extending upwardly from said bottom plate and inwardly from said front wall to define a wheel well extending into said box; said wheel well having an interior top well ceiling extending between said innermost side walls and interior rear well wall extending between said innermost side walls from said top well ceiling downwardly to said bottom plate to form a closed lower surface of said box; each of said innermost side walls including a generally horizontal elongate support surface protruding therefrom and spaced opposite each other to form upper and lower portions of said innermost side walls; said protruding support surfaces being adapted to rest upon rigid horizontal frame members of said cycle when said saddle box is positioned thereon, with the rigid frame members and cycle wheel extending into said wheel well of said box; a substantially vertical structure member depending from and coextensive with each of said horizontal support surfaces and

disposed substantially perpendicular thereto and bottoming outwardly from said wheel well to join with said lower portions of each of said innermost side walls; said vertical structure members having holes therethrough adapted to receive fastening means extending through said rigid frame members and said holes; and said horizontal support surfaces and vertical structure members being substantially thicker than the rest of said saddlebox to provide reinforcing structural support.

4,163,514
ADJUSTABLE STOCK FEED

Valdas S. Ramunas, Euclid, Ohio, assignor to Acme-Cleveland Corporation, Cleveland, Ohio

Filed May 9, 1977, Ser. No. 794,918
Int. Cl.[2] B65H *51/18, 51/32*
U.S. Cl. 226—141 **19 Claims**

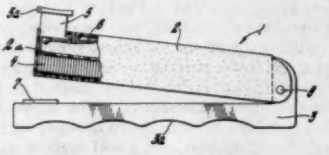


1. An adjustable feed mechanism for feeding elongated stock to a machine, comprising, in combination,
a frame,
a stock feeder positioned to feed elongated stock to the machine,
a support member mounted for movements in a path on said frame,
actuator means connected to move said support member in said path through a given length stroke,
a member having a curved track,
a transversely flexible elongated linkage,
means to connect said linkage to act between said actuator means and said stock feeder and engaging at least part of said curved track,
means establishing a curve which is the involute of a circle on one of said connection means and said curved track,
and adjustable means connected to utilize a different portion of said involute curve establishing means to change the length of elongated stock feed to the machine.

4,163,515
DISPOSABLE STAPLER APPARATUS AND METHODS OF CONSTRUCTING AND UTILIZING SAME

Peter R. Kapuscinski, 4117 Connie Dr., Sterling Heights, Mich. 48077

Filed Sep. 30, 1977, Ser. No. 838,382
Int. Cl.[2] B25C *5/00*
U.S. Cl. 227—120 **10 Claims**



1. In a stapler apparatus of the type comprising an elongated base member and an elongated staple magazine member pivotably secured together adjacent first ends of said members; means cooperating with said members for biasing said members in opposite directions relative to each other; said magazine member being provided at a second end thereof with staple dispensing means; said base member being provided at a second end thereof with a plate member; and said plate member and said staple dispensing means being adapted to cooperate to permit individual ones of said staples to be dispensed toward and against said plate member to perform a stapling operation when said members are pivoted toward each other, the improvement wherein:
said magazine member has a set of staples predisposed and aligned therein;
said set of staples being retained by a bar member superposed on said set of staples;
said bar member being immoveably affixed within said magazine member so that removing said bar member to insert a second set of staples is prevented.

4,163,516
METHOD FOR JOINING METAL BY SOLID-STATE BONDING

L. Elkin Burkhart, Oak Ridge; Chester R. Fultz, Kingston, and Kerry A. Maulden, Knoxville, all of Tenn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Dec. 28, 1977, Ser. No. 865,360
Int. Cl.[2] B23K *19/02*
U.S. Cl. 228—114 **3 Claims**

1. A method for solid-state bonding of metallic workpieces comprising the steps of placing planar surfaces of each workpiece in a parallel abutting relationship with one another in an evacuated environment, applying an axially directed pressure loading on at least one of the workpieces for forcing said surfaces together, oscillating one of said workpieces in a rotary motion a maximum distance of up to about one degree of travel during the application of said loading, and terminating the oscillation for effecting the solid-state bond.

4,163,517
TUBULAR CONTAINER

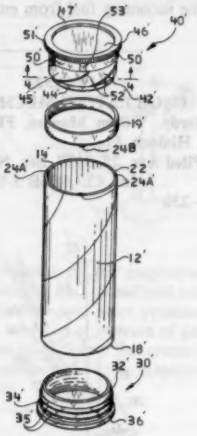
Hermann Kappler, Bayside, N.Y., and Norman A. Chezek, Clifton, N.J., assignors to Niemand Bros., Inc., Elmhurst, N.Y.

Filed Jun. 15, 1978, Ser. No. 915,667
Int. Cl.[2] B65D *3/10*
U.S. Cl. 229—45 **11 Claims**

1. An improved, tamper-proof, tubular container assembly, which comprises;
a tubular body having a closed end, an open end, a body wall with inner and outer surfaces joining said ends, and a removable body wall portion contiguous with the open end, said inner surface being deformable;
means associated with the body wall for fracturing said body wall and permanently separating the removable body wall portion, whereby access to the contents of the container assembly may be had; and
a removable closure member, mounted in and closing the open end of the tubular body, said closure member comprising a hollow cylinder having
(a) a first closed end;
(b) a second, beveled end, said bevel being angled toward the axis of said cylinder;
(c) a cylinder wall joining the first and second ends and having inner and outer surfaces, said outer surface being divided into a screw thread zone which is contiguous with the beveled end and an attachment zone between the screw thread zone and the first closed end; and
(d) a male screw thread formed on the outer surface of the cylinder in the screw thread zone; said mounting being effected by securing the inner surface of the removable

body wall portion of the tubular body to the attachment zone of the hollow cylinder, with the beveled end and screw thread zone positioned within said tubular body at a point between the closed end of the tubular body and the removable body wall portion;

the removable closure member being of a dimension



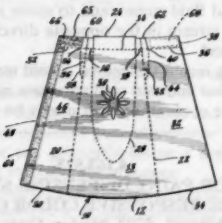
whereby the screw thread will deform the inner surface of the tubular body when the removable closure member is mounted in the open end of the tubular body, and form thereon a corresponding female screw thread in which the male screw thread will slide when the removable closure member is rotated so as to screw the closure member out of the open end of the tubular body.

4,163,518

AIR FRESHENER CARTON

George P. Webinger, Minneapolis, Minn., assignor to Champion International Corporation, Stamford, Conn.

Filed Jun. 9, 1978, Ser. No. 914,008
Int. Cl.[2] A61L 9/04; B65D 5/36
U.S. Cl. 229—8 12 Claims



1. A carton having a bottom opening for receiving an insert comprising:

a front panel having a convex lower edge, first and second side edges defined by straight fold lines which converte as they extend away from said lower edge, and an upper edge having a central segment defined by a straight fold line and first and second side segments, each extending from one end of said central segment to the adjacent side edge of said front panel;

first and second back panels, each extending from a side edge of said front panel to a free edge and having a curved lower edge which is a continuation of the lower edge of said front panel and an upper edge including a segment defined by a straight fold line extending between the free edge of the panel and a point spaced from the adjacent side edge of said front panel, said first and second back panels being secured to one another in overlapping relationship; and

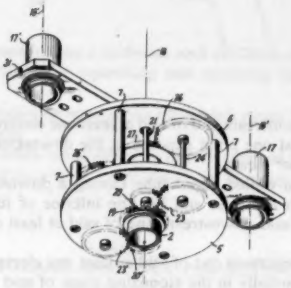
a top closure including a front panel extending from the central segment of said front panel and a bac flap comprising overlapping flaps extending from the straight segments at the upper edges of said first and second back panels, said front flap and said back flap being secured to one another in overlapping relationship.

4,163,519

COMPENSATING ROTOR

James Stabile, Scarsdale, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Filed Nov. 1, 1977, Ser. No. 847,615
Int. Cl.[2] B04B 9/08
U.S. Cl. 233—26 13 Claims



1. A compensating rotor having, in combination:

(a) a fixed base;

(b) a central vertical axis;

(c) an arm assembly rotatably mounted to the fixed base;

(d) a centrifugal processing container;

(e) a platform rotatably mounted to the arm assembly;

(f) means to secure the centrifugal processing container to the platform;

(g) a stationary feed and collection system;

(h) a flexible tubing loop for effecting the exchange of fluid between the centrifugal processing container and the stationary feed and collection system;

(i) a tube guide mounted on the arm assembly enclosing a segment of the tubing loop; and

(j) drive means including an inherently symmetrical load sharing epicyclic reverted gear train for rotating the platform and arm assembly in the same direction about the central vertical axis and at an angular velocity ratio of 2:1 respectively.

4,163,520

ELECTROSTATIC LIQUID SPRAYING NOZZLE

Felix Garcin, Grenoble, and Marcel Weil, Saint-Martin-d'Heres, both of France, assignors to Air Industrie, Courbevoie, France

Continuation of Ser. No. 702,422, Jul. 6, 1976, abandoned. This application May 16, 1978, Ser. No. 906,761
Int. Cl.[2] B05B 5/00
U.S. Cl. 239—707 6 Claims

1. An air-assited electrostatic round-spray nozzle which defines an outlet for a liquid to be sprayed and comprises:

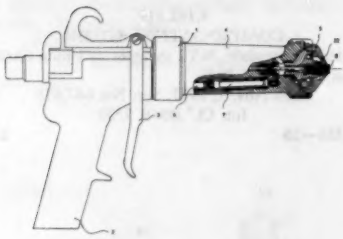
at least one charging electrode made of electrically conductive material and means for connecting said electrode to a source of high voltage,

diffuser means of electrically insulating material for shaping

the liquid to be sprayed into a thin-walled tube before it emerges from said nozzle, said diffuser means being within said thin walled tube and having a downstream end,

at least one outlet for atomizing gas adjacent said outlet for liquid to be sprayed,

and wherein all exposed portions of said nozzle, except for a downstream end of said at least one electrode, are of electrically insulating material,



said downstream end of said at least one electrode comprises at least one point exposed at the downstream end of the diffuser means,

said thin-walled liquid tube having a downstream portion which encircles and has the interior of its wall spaced from said downstream end of said at least one electrode, and

the downstream end of said at least one electrode is located substantially in the atomizing plane of said nozzle.

4,163,521

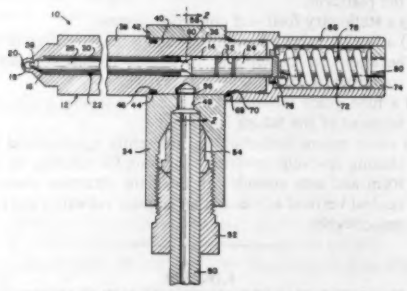
FUEL INJECTOR

Vernon D. Roosa, West Hartford, Conn., assignor to Stanadyne, Inc., Windsor, Conn.

Filed Nov. 25, 1977, Ser. No. 854,663

Int. Cl.[2] F02M *55/00*

U.S. Cl. 239—86 **6 Claims**



1. In a fuel injector for an internal combustion engine, said fuel injector having an elongated cylindrical body providing an axial bore forming a valve chamber having a valve seat and a discharge orifice at the forward end thereof, and inwardly opening pressure actuated valve in said bore for controlling the flow of fuel through said discharge orifice, and an inlet fitting for delivering pressurized fuel to said valve chamber, the improvement wherein said inlet fitting is provided with an enlarged circular opening surrounding said cylindrical body and engaging the same with a press fit, said cylindrical body and said inlet fitting defining a shallow peripheral groove therebetween, said groove having a depth which is less than the diameter of said discharge orifice, said inlet fitting further having an inlet passage communicating with said peripheral groove to accomodate the unrestricted flow of pressurized fuel thereto, and a port through the wall of said cylindrical body to provide communication between said peripheral groove and said valve chamber, said port being angularly displaced from said inlet passage to form a filter to prevent solid particles entrained in the incoming fuel from entering the valve chamber.

4,163,522

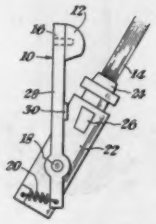
OSCILLATING MECHANISM

Charles T. Hardy, Wilton Manors, Fla., assignor to Safe-T-Lawn, Inc., Hialeah, Fla.

Filed Apr. 28, 1977, Ser. No. 791,851

Int. Cl.[2] B05B *3/00*

U.S. Cl. 239—230 **9 Claims**



1. An oscillating device for operation by a fluid stream the improvement comprising:

an oscillating member movable relative to the fluid stream and connected to said device, said member including a walling means on a first side of said member nearest said fluid stream and at least one dewalling means adjacent said walling means on said first side of said member,

said walling means connected to said member on said first side to provide a walling force to move said member into engagement with the fluid stream when the member is near the fluid stream and when at least a portion of said walling means is in contact with said fluid stream,

said dewalling means connected to said member and moved into the fluid stream by said walling means, said dewalling means providing a dewalling force to stop said member within said fluid stream and to move said member out of said fluid stream in the opposite direction from which it entered, and

a positioning means connected to said member to reposition said member and said walling means near the fluid stream so that the cycle of operation may be repeated.

4,163,523

MULTICOLOR PAINT DISPENSING SYSTEM HAVING A PRESSURE RESPONSIVE COLOR CHANGE VALVE

Raymond A. Vincent, 9307 Marion Crescent, Detroit, Mich. 48239

Filed Dec. 15, 1976, Ser. No. 750,836

Int. Cl.[2] B67D *5/60*

U.S. Cl. 239—305 **7 Claims**

1. A multi-color paint dispensing system wherein the color changing valve mechanism is proximate the dispensing paint comprising:

a paint atomizing gun;

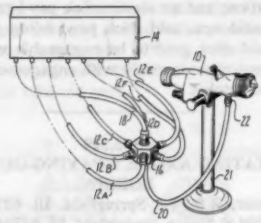
a plurality of paint supply lines;

means remote from said atomizing gun for selectively pressurizing each of said paint supply lines;

and a color changing valve mechanism proximate the atomizing gun and having a plurality of inlets, each inlet connected to a respective supply line and an outlet operatively connected to said atomizing gun;

said color changing valve mechanism including a plurality of paint pressure responsive valve means, each of said paint pressure responsive valve means individually connecting a respective inlet to said outlet;

said paint pressure responsive valve means including means creating communication between said respective inlet and



outlet upon pressurization of the respective connected supply line but preventing flow out of said color changing valve mechanism through said paint pressure responsive check valve means, whereby a pressure of predetermined value in an individual paint supply line created by pressurization of said line causes paint to be dispensed from that paint supply line only.

4,163,524

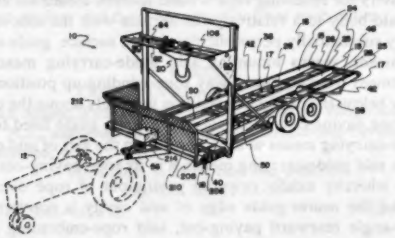
VARIABLE STACK FEEDER AND METHOD

Ezra C. Lundahl, Providence, Utah, and J. Gordon Wiser, Kirkland, Wash., assignors to Ezra C. Lundahl, Inc., Logan, Utah

Filed Jun. 22, 1978, Ser. No. 917,997

Int. Cl.[2] B02C *18/06, 21/02*

U.S. Cl. 241—30 **11 Claims**



1. A method of strip slicing foliage from the end of a stack thereof comprising the steps of:

placing the stack of foliage upon a vehicle and causing one end thereof to be disposed generally above a lateral cut foliage conveyor and generally below a cutting mechanism comprising rotatable blade means;

rotating the blade while displacing the blade in vertical and horizontal directions in a zig-zag pattern to successively horizontally slice strips of foliage from the face of the stack, which strips fall under force of gravity upon the lateral conveyor.

4,163,525

DEVICE FOR EVACUATING BLOW-BACK STEAM IN PULP REFINING APPARATUS

Rolf B. Reinhall, 834 171 Place, NE., Bellevue, Wash. 98008

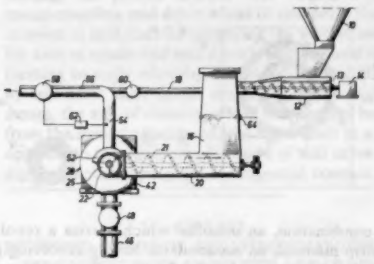
Filed Dec. 27, 1977, Ser. No. 864,313

Claims priority, application Sweden, Jan. 3, 1977, 7700047

Int. Cl.[2] B02C *7/00, 23/02, 23/26;* **D21B** *1/12*

U.S. Cl. 241—247 **3 Claims**

1. In a pulp refining apparatus in which lignocellulosic pulp stock is ground in an environment of superatmospheric steam in a grinding space defined between a pair of grinding members which rotate relatively to one another within a closed housing having a stock inlet opening into which the pulp stock is advanced by means of a feed screw rotating within a feed-in passage connected to the stock inlet opening, the improvement for evacuating blow-back steam escaping through said stock inlet opening, comprising:



(a) jacket means having a perforate wall mounted about said feed-in passage for separating and receiving blow-back steam;

(b) conduit means for evacuating blow-back steam from said jacket means;

(c) said feed screw being effective to maintain said perforate wall free of pulp stock entrained in the blow-back steam.

4,163,526

CABLE STORAGE ASSEMBLY FOR SCANNING APPARATUS

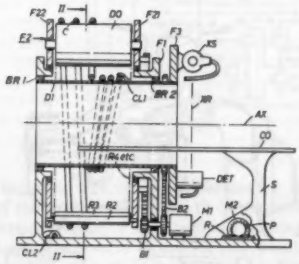
Anthony M. Williams, Iver, England, assignor to EMI Limited, Hayes, England

Filed Aug. 23, 1977, Ser. No. 827,007

Claims priority, application United Kingdom, Aug. 21, 1976, 34938/76

Int. Cl.[2] B65H *75/00*

U.S. Cl. 242—54 R **8 Claims**



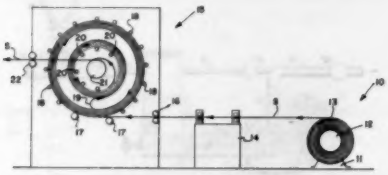
7. A cable handling arrangement for controlling a cable connecting two parts of an apparatus such as a scanning radiographic apparatus, relatively rotatable about a common axis, the arrangement including a first store means for holding a plurality of turns of the cable, wound in a first sense, stationary relative to one of said parts, a second store means for holding a plurality of turns of the cable wound in the opposite sense, stationary relative to the other part, and means operative in the course of relative rotation between said two parts of the scanning radiographic apparatus for progressively unwinding the cable from one store means and reversing and winding the cable onto the other store means, and transfer means for rotating about said axis relative to both parts and for transfering the cable, as it is reversed, from the one store to the other.

4,163,527

COIL DEPLETION SENSOR

Walter J. Hood, Shaker Heights, and George Gulden, Jr., Lyndhurst, both of Ohio, assignors to Kent Corporation, Twinsburg, Ohio

Filed Aug. 9, 1978, Ser. No. 932,272
Int. Cl.[2] B65H *17/48*; B21C *47/16*
U.S. Cl. 242—55 **14 Claims**



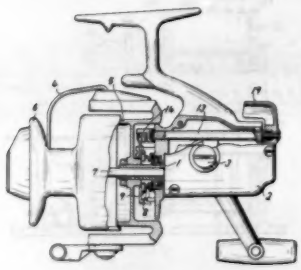
1. In combination, an uncoiler which carries a revolvable coil of strip material, an accumulator having revolving pinch rolls which draw strip material from the coil on said uncoiler, said accumulator at least temporarily storing a quantity of the strip material while transferring strip material to a processing line, and a control device, said control device comprising first means providing a signal proportional to the revolutions of said pinch rolls, second means providing a signal proportional to the revolutions of the coil, counter means having at least one predetermined number loaded therein and counting the occurrence of each signal from said first means, and means to reset said counter means to a said predetermined number if a signal from said second means is received by said means to reset before said counter means has counted a number equal to said predetermined number.

4,163,528

SPINNING REEL

Takashi Egasaki, and Hiroshi Kawai, both of Higashikurume, Japan, assignors to Daiwa Seiko Inc., Tokyo, Japan

Continuation of Ser. No. 635,776, Nov. 26, 1975, abandoned.
This application Oct. 28, 1977, Ser. No. 846,448
Int. Cl.[2] A01K *89/01, 89/02*
U.S. Cl. 242—84.21 R **2 Claims**



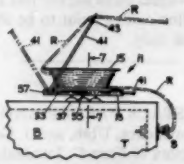
1. In a spinning reel for fishing which includes a casing having an end face; a rotor for engaging a fishing line; a sleeve rotatably supported in said casing; a handle shaft; a spool; and a spool shaft connected to said spool and inserted in said sleeve for sliding reciprocation with movement of said handle shaft to coil the fishing line on said spool upon rotation of said rotor, the improvement comprising a ratchet and a click gear secured to said sleeve; a pawl having an operating portion and means for pivotally mounting said pawl substantially at its center to said end face of said casing; a holding piece fixed to said pawl and movable therewith for holding both sides of said ratchet, said ratchet being positioned with respect to said pawl to be engageable with said pawl; an operating bar supported in said casing, said operating bar having a cam portion at an end thereof for moving said pawl into engagement with said ratchet, said operating portion of said pawl being in contact with said cam portion; an arm having a first and a second end; means for pivotally mounting said arm to said end face of said casing, said arm having a working portion at its second end, said working portion being in contact with said cam portion for moving said first end toward said click gear under action of said cam portion; and an elastic click pawl provided on said first end of said arm, said click pawl being positioned with respect to said click gear to be engageable with said elastic click pawl contemporaneously with engagement between said pawl and said ratchet.

4,163,529

NON-ROTATING AXIALLY-PAYING-OUT SKI-ROPE BOBBIN

Orville Krenzer, R.R. #3, Springfield, Ill. 62707; William E. Midden, 2036 S. Spring, Springfield, Ill. 62704, and Charles F. Schmid, 3408 S. Fourth, Springfield, Ill. 62703

Filed Sep. 14, 1977, Ser. No. 833,366
Int. Cl.[2] B65H *75/40*; B63B *21/56*
U.S. Cl. 242—85.1 **9 Claims**



1. A non-rotating axially-paying-out ski-rope bobbin comprising: a body shaped to define a circumferentially open annular cavity for receiving rope wound therein, means for attaching said body to a relatively flat surface with the axis of said cavity substantially perpendicular to said surface, guide-carrying means, means mounting said guide-carrying means for movement from an out-of-way rope-winding-up position generally below the cavity to a position generally above the cavity for rope paying-out, and a rope-embracing guide fixed to said guide-carrying means so as to be close to the axis of said cavity when said guide-carrying means is in its rope-paying-out position, whereby axially oriented paying-out of rope over and around the nearer-guide edge of said cavity is converted to wide-angle rearward paying-out, said rope-embracing guide being constructed and arranged to retain said rope therein while freely moving but to release said rope therefrom in response to an increased pull resulting when the rope is fully unwound and has its near end fastened to boat structure.

4,163,530

DEVICE FOR PREVENTING THE DRAWING-OUT OF A SEAT BELT WEBBING AT THE LOCK OF A RETRACTOR

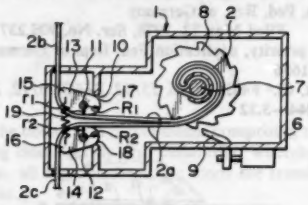
Yutaka Kondo, and Shuho Nishina, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Mar. 10, 1978, Ser. No. 885,333
Int. Cl.[2] A62B *35/00*; B65H *75/48*
U.S. Cl. 242—107.1 **3 Claims**

1. A seat belt system comprising:
a looped seat belt webbing;
first and second slip joints and a through-tongue plate through which said webbing is inserted;
a double take-up retractor about which said webbing may be wound, said retractor having a webbing take-out port;
first and second rollers which are disposed outside said webbing take-out port of said retractor and which are opposingly and rotatably mounted on a first shaft and a

second shaft provided in opposition to each other, respectively;

the respective rollers being spaced to permit said webbing to be drawn out in a state in which said webbing is attached or wound onto said retractor, having fore end sides and rear end sides and having surfaces extending between the fore end sides and rear sides which contact with webbings drawn out in one and the other directions from the space between said first and second rollers, said surfaces being formed into circular arc surfaces which extend in the respective directions in which the webbing is drawn out through the take-out port;



said circular arc surfaces on the rear end sides of said rollers gradually increasing in radial distance from the axes of the respective shafts in a direction from the fore end sides to the rear end sides;

a tension spring which is extended between the fore end sides of said rollers and which draws the respective fore end sides towards each other, said tension spring having a spring force to balance the tension needed on said webbing to draw it out; and

said webbing being tightly held between said rear end sides of said first and second rollers when said first and second rollers are turned by said webbing in directions in which their fore end faces move away from each other.

4,163,531

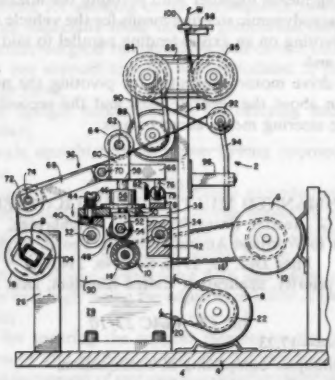
COIL WINDING APPARATUS

Imrich Miller, Paterson, and Lothar Freimuth, Ringwood, both of N.J., assignors to Universal Manufacturing Corporation, Paterson, N.J.

Filed Nov. 9, 1977, Ser. No. 849,784

Int. Cl.² B65H *54/30*

U.S. Cl. 242—158 R **15 Claims**



1. Coil winding apparatus for winding a wire on a bobbin comprising:

support means;

a drive shaft arranged for axial rotation carried by said support means; means for rotating said drive shaft in a first direction;

carriage means, means carried by said support means for guiding said carriage means for movement in a plane parallel to the axis of rotation of said drive shaft;

a drive wheel in rotational tangential contact with said drive shaft, a pivot shaft, means coupling said shaft to said carriage for pivotal motion with respect thereto and means coupling said drive wheel to said pivot shaft, means coupled to said shaft for supplying the wire to said bobbin, the axes of rotation of said drive wheel and said drive shaft forming an angle whereby the rotation of said drive wheel by said drive shaft causes the movement of said carriage means, the axis of rotation of said drive wheel being offset from the axis of rotation of said drive shaft in a direction opposite to the direction of roation of said drive shaft and drive wheel at their point of tangential contact.

4,163,532

TAPE SPEED CONTROL SERVOMECHANISM FOR A MAGNETIC TAPE CASSETTE APPARATUS

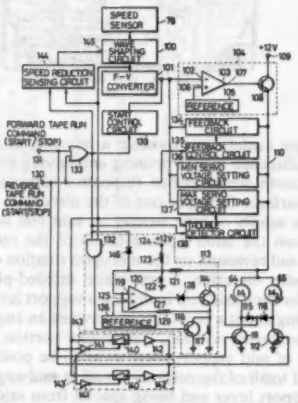
Yoshiaki Sakai, Musashino, Japan, assignor to Teac Corporation, Musashino, Japan

Filed Jan. 13, 1978, Ser. No. 869,243

Claims priority, application Japan, Jan. 31, 1977, 52-9418; Feb. 10, 1977, 52-13608; Feb. 10, 1977, 52-13609; Feb. 10, 1977, 52-13610; Feb. 10, 1977, 52-13611; Feb. 10, 1977, 52-13612; Feb. 10, 1977, 52-13613

Int. Cl.² G11B *15/32*

U.S. Cl. 242—186 **16 Claims**



1. In a magnetic tape cassette apparatus for use with a tape cassette of the type having a length of magnetic tape which extends between a pair of hubs within a housing for travel in both forward and reverse directions and which is partly exposed through a series of apertures formed in the front edge of the cassette housing, the apparatus including a magnetic head arranged for relative sliding contact with the tape through a centrally located one of the apertures in the cassette housing, a tape transport and speed control system comprising:

a variable speed motor for driving one of the cassette hubs;

another variable speed motor for driving the other cassette hub;

a speed sensing roller arranged for frictional contact with the tape through another of the apertures in the cassette housing which is located substantially closest to one of the cassette hubs which operates as the takeup hub during tape travel in the forward direction, whereby the speed sensing roller is held in proper frictional contact with the tape at least during forward tape travel for rotation at synchronous speed therewith;

speed sensor means driven by the speed sensing roller for

generating an electrical output signal representative of actual tape speed;

servo circuit means for comparing the output signal of the speed sensor means with a reference signal and for producing a servo output signal corresponding to the difference therebetween;

switching means for causing the servo output signal to be applied to a takeup side of one of the motors during tape travel in either direction; and

tape tension control circuit means for applying a controlled tape tension signal, derived from the servo output signal, to a supply side of one of the motors during tape travel in either direction in order to maintain constant tape tension.

4,163,533

TAPE CASSETTE

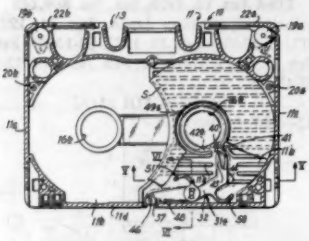
Akira Abe, Shiogama, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Dec. 7, 1977, Ser. No. 858,277

Claims priority, application Japan, Dec. 10, 1976, 51-166471[U]

Int. Cl.[2] G11B *23/10*

U.S. Cl. 242—198 **3 Claims**



3. A tape cassette comprising: a housing; at least one reel rotatably disposed in said housing and having a circular series of raked teeth which define respective substantially radially directed surfaces facing in one of the directions of rotation of the reel; a supply of tape wound on said reel so as to be unwound from the latter upon rotation of the reel in said one direction and rewound on the reel upon rotation of the latter in the opposite direction; a one-piece molded-plastic braking member for each said reel including a support lever movable in said housing about a pivot means between an engaged position and a disengaged position, a pawl-like portion on a resilient extension of said support lever so as to be positioned against said raked teeth of the respective reel in said engaged position of the support lever and being spaced from said teeth in said disengaged position, said resilient extension permitting angular displacement of said pawl-like portion relative to said support lever so that, with the latter in said engaged position, rotation of said respective reel in said opposite direction for rewinding the tape thereon causes said raked teeth to move past said pawl-like portion as the latter is angularly displaced in one direction relative to the support lever to substantially free the reel for said rotation in said opposite direction thereof, whereas rotation of said respective reel in said one direction for unwinding the tape therefrom brings one of said surfaces of the raked teeth against said pawl-like portion so as to urge the latter to be angularly displaced in the opposite direction relative to said support lever, and spring means including one resilient arm integral at one end with said support lever and extending in a direction away from said support lever into engagement with said housing for yieldably urging said support lever to said engaged position thereof; another resilient arm extnding from said lever, said one resilient arm and said other resilient arm engage said housing at respective spaced apart locations both spaced from said pivot means for urging said lever to said engaged position; abutment means in said housing engageable by said pawl-like portion of the braking member in said engaged position of the support lever for blocking angular displacement of said pawl-like portion in said opposite direction relative to said support lever and thereby preventing unwinding of the tape from said reel; and said housing having an opening at which a portion of said support lever is accessible from the exterior of the housing for actuation of said support lever to said disengaged position against the force of said spring means.

4,163,534

STEERING OF AN AERODYNAMIC VEHICLE

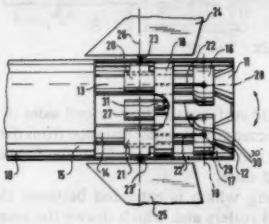
Hans-Jochen Seeger, Ganderkesee, Fed. Rep. of Germany, assignor to Vereinigte Flugtechnische Werke-Fokker GmbH, Bremen, Fed. Rep. of Germany

Filed May 12, 1978, Ser. No. 905,237

Claims priority, application Fed. Rep. of Germany, May 13, 1977, 2721656

Int. Cl.[2] F42B *15/16, 15/18;* B64C *15/12, 19/02*

U.S. Cl. 244—3.22 **9 Claims**



1. Apparatus for controlling the steering of an aerodynamic, propelled vehicle, comprising:

duplex nozzles including a first and a second thrust producing nozzle;

means for mounting the first and second nozzles for pivoting on a common first axis, and for pivoting each of the nozzles on a separate axis extending transversely to the first axis;

first aerodynamic steering means for the vehicle mounted for pivoting on an axis extending in the same direction as the first axis;

first and second drive motors, respectively, coupled to the first and second nozzles for pivoting them individually about the first axis, further coupled to the first aerodynamic steering means for pivoting the first aerodynamic steering means together with pivoting the nozzles;

second aerodynamic steering means for the vehicle mounted for pivoting on an axis extending parallel to said separate axes; and

a third drive motor connected for pivoting the nozzles in unison about the separate axes and the second aerodynamic steering means about its axis.

4,163,535

UNMANNED MULTIMODE HELICOPTER

Reginald G. Austin, Brent Knoll, Nr. Highbridge, England, assignor to Westland Aircraft Limited, Yeovil, England

Filed Dec. 13, 1972, Ser. No. 314,494

Claims priority, application United Kingdom, Dec. 13, 1971, 57794/71

Int. Cl.[2] B64C *27/10*

U.S. Cl. 244—17.23 **7 Claims**

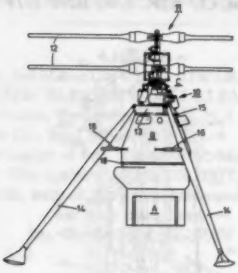
1. A helicopter comprising in combination,

a plurality of separable modules arranged in a substantially vertically stacked assembly,

the modules including an uppermost propulsion module, a central fuel tank module and a lowermost control and payload module, a collar supporting the propulsion mod-

ule, attachment means on said collar and suspending the fuel tank module,

a tripod undercarriage means attached to and equispaced



around the collar, said tripod means comprising three legs extending downwardly and outwardly, whereby during operation, all flight and landing loads are transferred to said collar.

4,163,536

SUPPORT DEVICE

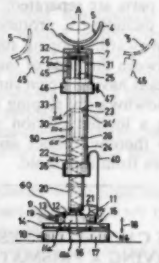
Rudolf Heller, and Kurt Schattmaier, both of Zürich, Switzerland, assignors to Contraves AG, Zürich, Switzerland

Filed Sep. 8, 1977, Ser. No. 831,431

Claims priority, application Switzerland, Oct. 28, 1976, 13595/76

Int. Cl.[2] B68G *5/00*

U.S. Cl. 248—118 **5 Claims**



1. A device for assisting in the performance of exact hand movements, especially those of a surgeon when carrying out delicate micro-surgical operations, which device comprises:

at least one support member accommodated to the human arm or hand;

a single upright column means for carrying said support member;

said single upright column means having opposed end regions;

means including a hinge arrangement provided at one end region of said single upright column means for enabling a desired freedom of movement of said column means throughout a predetermined spatial region;

a first brake device cooperating with said hinge means for freely brakingly fixing the adjusted position of the column means;

means for securing the support member to the other end region of said column means and for enabling free rotational movement of said support member about the lengthwise axis of said column means;

means arranged within said column means for the continuous elevational adjustment of said column means; and

a second brake device for fixing the elevationally adjusted position of the column means and thus the support member.

said second brake device comprising:

a housing provided with recess means;

two annular brake ring members arranged in said recess means and engaging about said upright tube;

means for hingedly connecting the brake ring members at one side with said housing;

a compression spring arranged between and at the other side of said brake ring member; and

a Bowden cable for actuating said second brake device.

4,163,537

BEARER STRUCTURE FOR ASSEMBLING MODULAR ELEMENTS

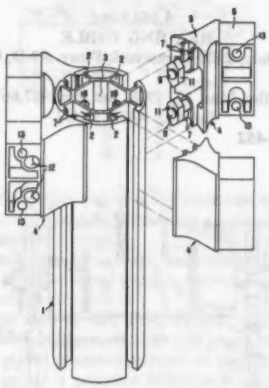
Pascal N. Mourgue, Paris, France, assignor to Societe Anonyme des Ateliers Marcadet Mobilier, Le Blanc Mesnil, France

Filed Jul. 7, 1977, Ser. No. 813,466

Claims priority, application France, Jul. 12, 1976, 76 21360

Int. Cl.[2] F16S *3/00*

U.S. Cl. 248—188.1 **11 Claims**



1. A bearer structure for assemblying modular elements, comprising:

uprights constituted by cylindrical sectional elements having T grooves parallel to the axes of the sectional elements and regularly distributed at the periphery, said T-grooves being symmetrical about a plane containing the axes of the sectional elements, and said uprights having a central hollow;

and members connecting said uprights, said connecting members comprising a part engageable and lockable in said grooves at the desired height, a projecting part, and a cross-piece fixed at its end to said projecting part, said cross-piece supporting various constituent modular elements for office units of various configurations;

wherein the wall separating the grooves from the central hollow of the sectional elements is pierced by positioning and fixing holes in which are engaged the ends of bolts passing through the connecting members; and

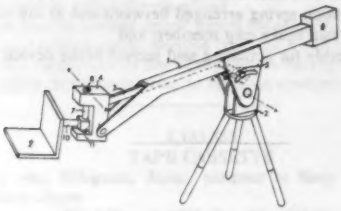
wherein the ends of said uprights are adapted to receive cylindrical end fittings and screw jacks, said cylindrical end fittings and screw jacks having clamped therebetween, at an upper part of said uprights, lugs connected to a partition.

4,163,538

TORSION COUNTERACTING PIVOTS

Edward R. D. Galione, Bury St. Edmunds, England, assignor to W. Vinten Limited, Bury St. Edmunds, England

Filed May 31, 1978, Ser. No. 911,170
Int. Cl.[2] A47F 5/00
U.S. Cl. 248—278 **7 Claims**



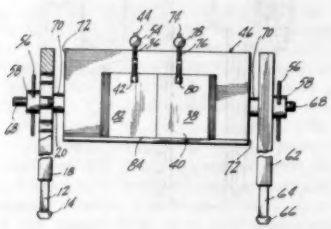
1. A hinged joint comprising a double ended bracket, a spindle pivotally mounted between the ends of said bracket, means mounting a first end of said spindle for rotation about the axial center thereof, and means mounting the second end of said spindle for rotation about the axial center thereof and for moving the second end of said spindle along a diametric line of the spindle during rotation of the spindle.

4,163,539

READING TABLE

Duke L. Awofolu, 2600 Campcreek Pkwy #9-D, College Park, Ga. 30337

Filed Mar. 17, 1978, Ser. No. 887,667
Int. Cl.[2] A47B 97/04
U.S. Cl. 248—452 **7 Claims**



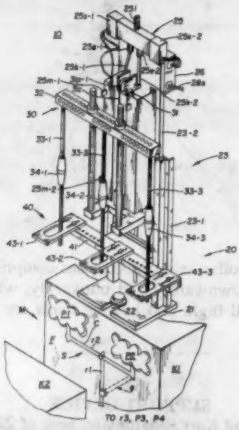
1. A book holding table comprising a sheet, a pair of posts, said pair of posts each having a plurality of connected spaced apart openings disposed in spaced apart relationship therein, a pair of threaded rods, said pair of threaded rods being aligned in coaxial relationship extending outwardly and fixedly secured to opposed marginal edges of said sheet, each of said pair of threaded rods residing in one of said plurality of openings, a pair of nuts, each of said pair of nuts threadingly engaged adjacent the free end of each of said threaded rods, a pair of curved rods, said each of said pair of curved rods fixedly secured to one end of said each of said pair of posts, a pair of bars, said pair of bars each having a cavity therein, said cavity being configured to reside about a marginal edge of said sheet, a rack, said rack passing through an opening in one of said bars, a gear, said gear journaled to said bar, said gear having the teeth thereof coupled to the teeth of said rack, an arm, said arm pivotably lockingly engaged to one end of said rack, said arm being disposed in selective locations outwardly from an exterior surface of said sheet, a single bar, said single bar being disposed fixably secured to an uppermost lateral surface of said sheet and adjacent another marginal edge thereof, said another marginal edge being located opposed to said marginal edge of said sheet.

4,163,540

EJECTION OF MOLDED MATERIALS

Ralph J. Cafarelli, 228 Stone St., Clinton, Mass. 01510

Filed Jun. 8, 1977, Ser. No. 804,558
Int. Cl.[2] B29C 7/00; B29F 1/14
U.S. Cl. 249—67 **14 Claims**



1. Apparatus for deflecting a molded structure from a molding machine comprising

a mold with separable parts within the machine,

a movable member mounted on the machine,

a flexible rod secured to said movable member for entering the space between the molded structure and one of said parts when the parts are separated,

said flexible rod including a protuberance having an inwardly and downwardly sloping surface at an intermediate position between the ends of said rod,

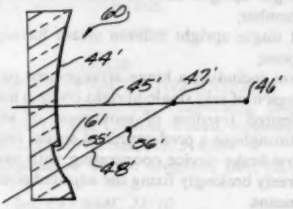
and deflection means having a cam surface for engaging the inwardly and downwardly sloping surface of said protuberance during a limited portion of the stroke of said flexible rod to thereby deflect said rod and kick said molded structure from said mold.

4,163,541

MOLD FOR THE CASTING OF RESIN OPHTHALMIC LENSES HAVING A PRISMATIC SEGMENT

Charles D. Campbell, La Jolla, Calif., assignor to Signet Optical Corporation, San Diego, Calif.

Continuation-in-part of Ser. No. 765,536, Feb. 4, 1977, abandoned. This application Feb. 9, 1978, Ser. No. 876,323
Int. Cl.[2] B29C 5/00; B29D 11/00
U.S. Cl. 249—117 **14 Claims**



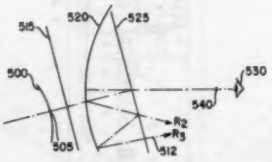
1. A mold for casting a resin ophthalmic lens comprising a disc defining a principal casting surface on one face thereof, the casting surface being a portion of a surface of revolution having a first axis of symmetry and having an effective center of curvature located therealong, the casting surface having in a selected portion thereof a recess having a bottom surface

which defines in the mold a minor casting surface and which is a portion of a surface of revolution having a second axis of symmetry, said axes of symmetry intersecting, if at all, at a location on the first axis of symmetry other than at substantially the center of curvature of the principal casting surface.

4,163,542
OPTICAL IMAGE-FORMING APPARATUS WITH TILTED BI-REFRINGENT ELEMENTS

Joseph A. La Russa, Yorktown Heights, N.Y., assignor to Farrand Optical Co., Inc., Valhalla, N.Y.

Continuation-in-part of Ser. No. 685,017, May 10, 1976, Pat. No. 4,093,347. This application Aug. 29, 1977, Ser. No. 828,783
The portion of the term of this patent subsequent to Jun. 6, 1995, has been disclaimed.
Int. Cl.[2] G02B *5/32, 27/28*
U.S. Cl. 350—3.72 **4 Claims**



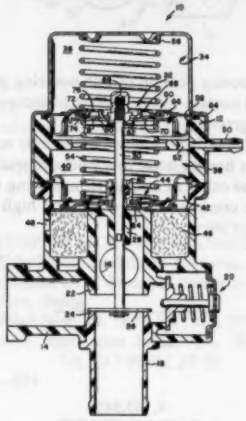
1. Optical apparatus comprising:
(a) display means for displaying an image toward an observer location; and
(b) infinity display means positioned between said display means and said observer location, said infinity display means comprising:
1. an optical element functioning as a beam-splitting curved mirror having a predetermined optical axis between said element and said observer location; and
2. a bi-refringent package comprising:
(A) a first quarter-wave plate disposed on the concave side of said optical element;
(B) a plane beam-splitting mirror disposed on the side of the first quarter-wave plate remote from the optical element;
(C) a second quarter-wave plate disposed on the side of the plane beam-splitting mirror remote from the first quarter-wave plate; and
(D) a polarizer on the side of the second quarter-wave plate remote from the plane beam-splitting mirror; the first and second quarter-wave plates having their fast axes oriented with respect to each other at a substantially integral multiple of 90°, and the polarizer having its plane of polarization oriented substantially at an odd integral multiple of 45° to the fast axis of the second quarter-wave plate;
wherein the bi-refringent package is tilted with respect to a plane normal to the optical axis between said element and said observer location, so that certain undesired images and reflections are directed away from said observer location and are brought to a focus closer than infinity.

4,163,543
AIR CONTROL VALVE

John E. Cook, Chatham, Canada, assignor to Fram Corporation, East Providence, R.I.

Filed Sep. 7, 1977, Ser. No. 831,217
Int. Cl. F16k *31/126*
U.S. Cl. 251—48 **9 Claims**

1. In a control valve, a housing defining a pair of chambers, said housing having an inlet and a pair of outlets communicating with one of said chambers, control valve means in said chamber for controlling communication between said inlet and outlets, an actuating rod connected to said control valve means and extending into the other chamber, a pair of pistons slidably mounted in said other chamber and cooperating with said housing to define a first section between one of said pistons and a corresponding end of said other chamber, a second section between the other piston and the corresponding end of said other chamber and a third section between said pistons, said one piston being fixedly secured to said actuating rod, said other piston being slidable relative to said actuating rod, means communicating a substantially constant reference pressure to the first and second sections and a variable pressure signal to said third section, and yieldable means interconnecting said pistons and urging said one piston a predetermined distance away from the other piston for a corresponding predetermined value of said pressure signal, but permitting said one piston to



move toward the other piston when variations in said pressure signal increase the pressure differential across said one piston.

2. The invention of claim **1**:
said reference pressure being atmospheric pressure, said variable pressure signal being a vacuum.

4. The invention of claim **2**:
and a piston stop in said third section, said other piston moving into engagement with said piston stop when said pressure signal is communicated to said third section to thereby create a pressure differential across said other piston.

5. The invention of claim **4**:
and timing valve means carried by said one piston for controlling communication between said first and third sections to permit restricted communication therebetween.

4,163,544
TWO PIECE COMPOSITE VALVE SEAL RING CONSTRUCTION

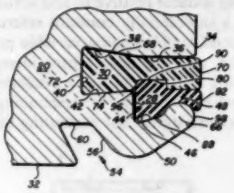
James M. Fowler, Missouri City, and Bertram L. Morrison, Houston, both of Tex., assignors to ACF Industries, Incorporated, New York, N.Y.

Filed Nov. 10, 1977, Ser. No. 850,184
Int. Cl.[2] F16K *3/02, 5/06*
U.S. Cl. 251—328 **8 Claims**

1. A valve comprising:
(a) a body with inlet and outlet flow passageways therethrough, a valve chamber therein in fluid communication with the inlet and outlet passageways, a valve member in the valve chamber movable between open and closed positions, an annular groove about one of the passageways facing the valve chamber and defined by inner and outer walls;
(b) inner and outer concentric seal rings positioned in side by side relation in said groove with said outer seal ring

against said outer wall and said inner seal ring against said inner wall;

(c) said seal rings having respective flat interfitting surfaces thereon engaged with one another in an interlocking manner to hold the seal rings together against one another in the groove and to prevent relative longitudinal movement between the seal rings, and means including an enlarged projecting portion of one seal ring projecting into an enlarged portion of the groove to secure the seal rings within the groove;



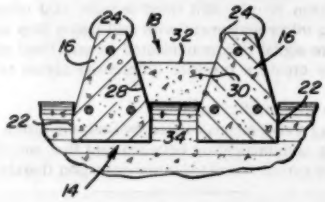
(d) one of said seal rings being of a relatively soft elastomeric composition having good low pressure sealing characteristics and the other of said seal rings being of a relatively hard plastic composition having good high pressure sealing characteristics.

4,163,545

CATTLE GUARD

Joseph Ostermiller, Goulding Creek Route, Roundup, Mont. 59072

Filed Jan. 31, 1977, Ser. No. 764,462
Int. Cl.² A01K *3/00*; E01B *17/00*
U.S. Cl. 256—17 **6 Claims**



1. A cattle guard, comprising, in combination:

(a) a plurality of spaced, coextensive, substantially parallel support beams;

(b) a plurality of rails arranged transversely of, anchored on, and supported by the support beams, each of the rails being substantially in the form of a longitudinally extending frustum of a rectangular pyramid including longitudinally extending side walls converging toward one another and away from the support beams; and

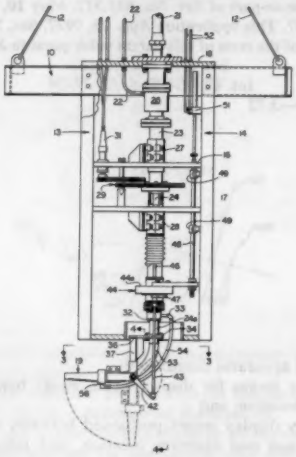
(c) wedge means disposed btween the rails for stabilizing the rails on the support beams, the wedge means including a plurality of wedge elements each a single piece separate from the rails and in the shape of an obelisk removably arranged in inverted orientation for wedging against the converging side walls of adjacent ones of the rails and preventing rocking movement of the rails relative to the support beams.

4,163,546

APPARATUS FOR APPLYING GRANULAR REFRACTORY MATERIAL TO SURFACES

John C. Morris, 3573 Riverbend Rd., Birmingham, Ala. 35243; James K. Weidman, 212 Azalea Dr., Gadsden, Ala. 35901, and Michael D. Prior, P.O. Box 139, Smith Cir., Pell City, Ala. 35125

Filed Mar. 6, 1978, Ser. No. 883,731
The portion of the term of this patent subsequent to Jul. 11, 1995, has been disclaimed.
Int. Cl.² B05B *3/00*
U.S. Cl. 266—281 **3 Claims**



1. In apparatus for applying granular refractory material to the interior surfaces of an open top ladle, furnace or the like,

(a) a pair of generally vertically disposed telescopically related conduits,

(b) means to supply granular refractory material to the upper end of the inner one of said conduits,

(c) means to supply water to the upper end of the outer one of said conduits,

(d) means to support said conduits for substantially 360° simultaneous rotation,

(e) said inner conduit having a lower end portion projecting past the lower end of the outer conduit,

(f) a nozzle support member secured to a projecting portion of the lower end of the inner conduit,

(g) a mixing nozzle mounted on the support for the discharge end thereof to move in a generally vertical plane,

(h) a flexible conduit connecting the nozzle to the inner conduit, whereby the conduit may receive and discharge granular material flowing down the inner conduit,

(i) means to supply water from the lower end of the outer conduit to the nozzle, and

(j) power means operatively connected to the nozzle and adapted to move it in said substantially vertical plane through an axis of substantially 90°, namely, from substantially horizontal position to substantially vertical position.

4,163,547

CLAMPING APPARATUS FOR ASSEMBLING PICTURE FRAMES

Henry M. Jerome, 1689 Sherway Dr., Mississauga, Ontario, Canada (L4X 1C9)

Filed Feb. 21, 1978, Ser. No. 879,230
Int. Cl.² B25B *1/20*
U.S. Cl. 269—42 **11 Claims**

1. A clamping apparatus for use in assembling a picture frame comprising:

(a) an anchoring corner block having frame support surfaces adapted to engage adjacent ends of one pair of picture

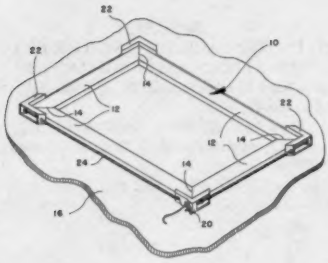
frame members of an assembled set of picture frame members arranged in the required frame configuration,

(b) a flexible cable,

(c) first securing means on said anchoring corner block for securing one end of said flexible cable with respect to said anchoring corner block and second securing means on said anchoring corner block for releasably securing a second end of said flexible cable,

(d) said flexible cable having a sufficient length to extend from said first securing means about the external periphery of the assembled set of picture frame members to said second securing means,

(e) a plurality of secondary corner blocks, each having; a frame support surface adapted to engage and support a pair of adjacent ends of the assembled set of picture frame members, cable guide means on each secondary corner block adapted to receive and guide said flexible cable therealong such that said flexible cable may be drawn tightly about said assembled set with the tensile load



which is applied to the cable in use substantially uniformly distributed along the length of the flexible cable from said first securing means to said second securing means of said anchoring corner block,

(f) said anchoring corner block and said secondary corner blocks each having a pair of oppositely disposed mounting faces extending in parallel planes which are uniformly spaced from a central plane located at half the height to each block such that either of said mounting faces may be located in a datum plane during assembly of a picture frame,

(g) said guide means of each secondary corner block including a set of two guide slipways, the slipways of each set being vertically spaced with respect to one another and each set of slipways being uniformly vertically offset with respect to said central plane to provide support for said flexible cable in either one of two planes disposed on either side of said central plane whereby said flexible cable may be supported in any one of four clamping planes disposed at different heights above said datum plane.

4,163,548

METHOD OF LAPPING WEBS AND PRODUCT

Ernst D. Nystrand, Scottsdale, Ariz., assignor to Paper Converting Machine Company, Green Bay, Wis.

Filed Jan. 23, 1978, Ser. No. 871,236
Int. Cl.[2] B41L *1/32*
U.S. Cl. 270—39 **3 Claims**

1. A method of lapping sheets comprising:

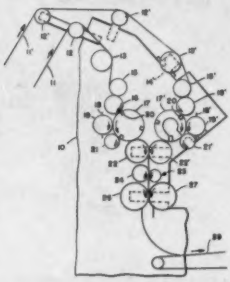
advancing a web from each of a pair of parent rolls,

transversely severing each web into discrete identical sheets having leading and trailing edges and to form a series of moving sheets from each web wherein each sheet of a series is adjacent a preceding sheet and a following sheet,

retarding each sheet in each series to lap the same relative to its preceding and following sheets,

retarding one series relative to the other so that upon combining the two series the leading and trailing edges of one series will be offset relative to the leading and trailing edges of the other series,

orienting the lapped sheets in one series reversely to the orientation of the sheets in the other series so that upon



combining the two series only one of the leading and trailing edges is exposed and facing in the same direction, and

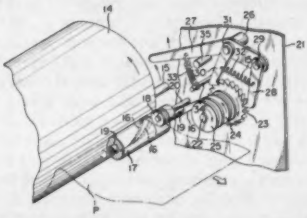
combining the two series of sheets.

4,163,549

SEPARATOR DEVICE FOR TRANSFER MEDIUM

Yoshio Ito, Yokohama; Yoshikuni Tohyama, Tokyo, and Seiji Sagara, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 15, 1977, Ser. No. 777,829
Claims priority, application Japan, Mar. 23, 1976, 51-31863
Int. Cl.[2] B65H *29/56*
U.S. Cl. 271—174 **11 Claims**



1. A separator device for use in an image formation apparatus wherein an image is transferred from a movable image bearing member to a transfer material, comprising:

a separation roller disposed downstream of a position where an image on the image bearing member is transferred onto the transfer material;

a separation belt disposed to contact the image bearing member at said transfer positon and to keep a lateral end portion of the transfer material out of contact with the image bearing member, wherein said separation belt also contacts said separation roller to guide the transfer material in a direction away from the image bearing member;

rotatable means for storing an unused portion of said separation belt wound therearound;

means for restraining the rotation of said storing means in a direction to feed out the unused portion of said belt;

means for taking up thereon the used portion of said belt;

means for feeding the belt from said belt storing means to said belt take-up means against the restraining action of said restraining means; and

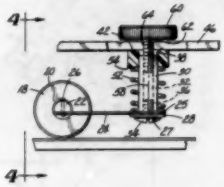
means for actuating said feeding means in response to the movement of an element which moves during an image formation process of said image formation apparatus.

4,163,550

PRESSURE ROLLER ASSEMBLY

Joel D. Armstrong, Antioch, Ill., assignor to AM International, Inc., Los Angeles, Calif.

Filed Aug. 10, 1977, Ser. No. 823,435
Int. Cl.[2] B65H 5/06
U.S. Cl. 271—274 **2 Claims**



1. For use with a conveyor having movable surface means for engaging and moving sheet material articles, apparatus for applying pressure to sheet material articles being moved by the conveyor for holding the sheet material articles against the conveyor, said apparatus comprising a pressure roll forming a nip with the moving surface means of the conveyor, a leaf spring having a first end connected with said pressure roll and including means for supporting said pressure roll for rotation about a central axis thereof, a support post disposed normal to the longitudinal axis of said leaf spring, means for fixedly connecting a portion of said leaf spring remote from said first end to said support post to extend therefrom in cantilever fashion, means for mounting said support post including guide means for guiding said support post for axial movement and for restraining movement of said support post in directions transverse to its central axis, and means for adjusting the axial position of said support post for adjusting the pressure on a sheet material article in the nip between said pressure roll and the moving surface means, said means for adjusting the axial position of said support post comprises a rotatable member concentric with the axis of said support post and including a threaded member integral therewith, and further comprising at least one fixed support disposed in spaced relation to the movable conveyor surface means, said guide means comprising a guide block, means for biasing said guide block into engagement with said fixed support, said guide block including a bore and said support post extending through said bore, said bore defining means for guiding said support post for axial movement and for restraining movement thereof in directions transverse to its axis, said support post including an axially extending threaded bore receiving said threaded member of said rotatable member whereby rotation of said rotatable member moves said support post axially, and

wherein said means for connecting said leaf spring to said support post includes a support member affixed to said support post and wherein said support member includes a substantially flat surface portion, said leaf spring comprising a substantially flat longitudinally extending planar member, one longitudinal end portion of said leaf spring being fixedly connected with said surface portion of said support member, said means for biasing said guide block against said fixed support comprising spring means acting between said guide block and said flat surface portion of said support member.

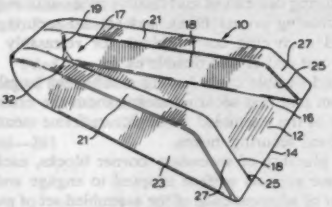
4,163,551

VAULTING PRACTICE BOX

Bruce A. Simpson, 130 Howland Ave., Toronto, Ontario, Canada (M5R 3B5)

Filed Feb. 27, 1978, Ser. No. 881,906
Int. Cl.[2] A63B 5/00
U.S. Cl. 272—104 **4 Claims**

1. A vaulting practice box comprising a flat horizontal bottom wall having a rear edge, and having side edges converging forwardly from said rear edge and a front end, side walls extending upwardly from said side edges and integral therewith, said side walls closing together at the front to form an integral structure extending upwardly from the front end of



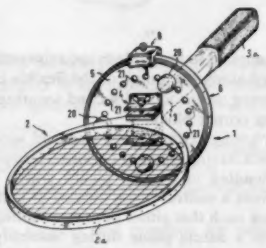
the bottom wall, and means integral with each side wall defining a pocket outwardly adjacent each side wall, said pockets being adapted to receive and retain inertial weights.

4,163,552

APPARATUS FOR FACILITATING THE PRACTICING OF TENNIS AND LIKE GAMES

Marian Tiso, Kurt-Eisner-Strasse 25, D-8000 München 83, Fed. Rep. of Germany

Filed Mar. 16, 1978, Ser. No. 887,312
Claims priority, application Fed. Rep. of Germany, Mar. 24, 1977, 2713089
Int. Cl.[2] A63B 69/38
U.S. Cl. 273—29 A **20 Claims**



1. Apparatus for indicating various stages of strokes which are practiced by the user of a ball-striking implement, particularly a tennis racket, having a handle and a ball-contacting portion, comprising a support which is connected to the handle; annular guide means provided on said support and spacedly surrounding the handle; and signal generating means including a carriage movably mounted on said guide means and means for producing signals in preselected positions of said carriage with respect to said guide means.

4,163,553

TENNIS RACKET AND STRINGING METHOD

Robert Renfro, P.O. Box 1085, Sun Valley, Id. 83353

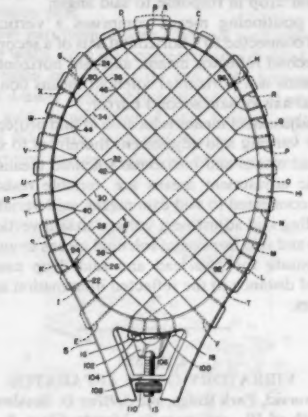
Filed Mar. 4, 1977, Ser. No. 774,580
Int. Cl.[2] A63B 51/00
U.S. Cl. 273—73 D **15 Claims**

1. A sports racket comprising: a string support frame, having a racket handle, and a racket head attached to said handle and defining a central opening; and

a string attached to said racket head and forming a pattern within said central opening, and

said pattern consisting of plural, string sections each connected between two points on said frame and extending along a straight axis through said points of connection, said axes of each section being substantially parallel to the

others, and each section consisting of plural straight string segments zig-zagging along said straight axis;



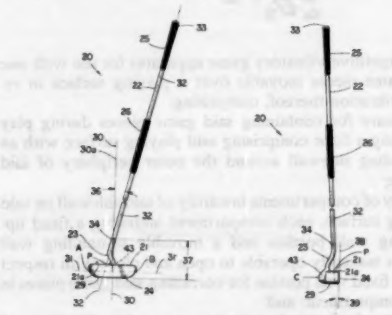
elbow-like junctions formed by adjoining segments, each said elbow-like junction of each said string section interlocking with an elbow-like junction of an adjacent section.

4,163,554

GOLF PUTTER

Floyd V. Bernhardt, 5532 N. High School Rd., Indianapolis, Ind. 46254

Filed Sep. 19, 1977, Ser. No. 834,508
Int. Cl.² A63B *53/02*
U.S. Cl. 273—80 C **23 Claims**



1. A golf putter for putting in a modified croquet style which comprises:

an elongated shaft having upper and lower gripping means thereon and a primary longitudinal axis;

a clubhead connected to said elongated shaft, said clubhead having a rear surface, a substantially flat sole portion, a ball-striking surface substantially perpendicular to said sole portion and a vertical axis;

said vertical axis being perpendicular to said sole portion and lying within an axis plane which is perpendicular to said ball-striking surface, said axis plane being substantially coincident with the centerline of said ball-striking surface;

said ball-striking surface lying in a striking plane disposed at an angle of from 1 degree to 8 degrees with respect to said primary longitudinal axis and having zero loft when said substantially flat sole portion is substantially parallel with the ground; and

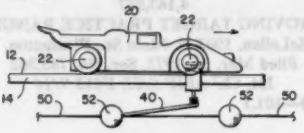
said primary longitudinal axis being divergent from said axis plane by at least 10 degrees and intersecting said axis plane at a point above said clubhead.

4,163,555

SLOT CAR GAME WITH SPIN-OUT RECOVERY CAPABILITY

Robert H. Norwalt; Edward R. Hibbert, both of Northridge, and Vicki L. Schiff, Redondo Beach, all of Calif., assignors to Sega Corporation, Redondo Beach, Calif.

Filed Jan. 23, 1978, Ser. No. 871,261
Int. Cl.² A63F *9/14*
U.S. Cl. 273—86 B **10 Claims**



1. Improved slot car apparatus including a roadway having at least one slotted track with and at least one electrical contact strip positioned relative to each track and connected to an electrical power source, and at least one slot car vehicle adapted to travel about each of said oscillatory tracks deriving its electrical power from said at least one electrical contact strip, wherein the improvement comprises means to realign said at least one slot car vehicle after misalignment, said means comprising:

guide means secured to the underside of said at least one vehicle projecting vertically into said slotted track; and

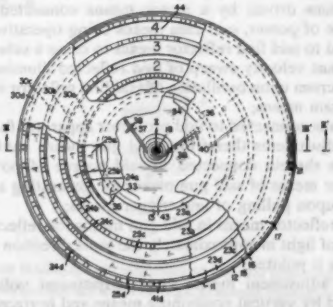
a continuous chain positioned below each of said at least one slotted track having engaging means at fixed locations about said track, said continuous chain adapted to be activated to permit the engaging means on said chain to engage the guide means of said misaligned vehicle and realign said vehicle.

4,163,556

VARIED TRACK ADVANCEMENT GAME MECHANISM

George Bertin, 35 W. 93rd St., New York, N.Y. 10025

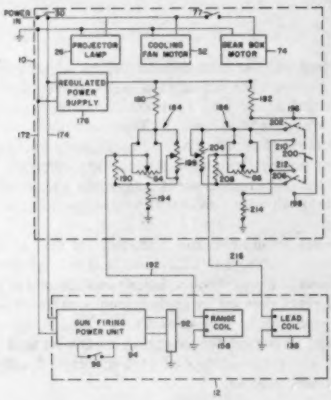
Filed Apr. 17, 1978, Ser. No. 896,749
Int. Cl.² A63F *5/04, 9/14*
U.S. Cl. 273—86 H **8 Claims**



1. A varied track advancement game mechanism comprising (a) a base; (b) a plurality of circular tracks disposed on said base for concentric rotational advancement, each of said tracks having a plurality of teeth defining spaced interdental recesses; (c) pawl means associated with each of said tracks, said pawl means being operable to engage said track teeth for advancement of said track in a first rotational direction; (d) means operable to rotationally advance in unison all of said pawl

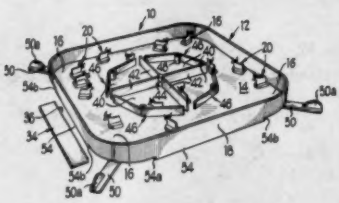
means in said first direction and to thereby advance any of said tracks engaged by its associated pawl means; and (e) a plurality of program rings, each of said program rings being disposed in concentric, adjacent relationship with one of said tracks for independent rotational advancement, said program ring having (i) a pawl-restraining surface operable to prevent said pawl means from entering said interdental track recesses for engagement of said teeth and (ii) a plurality of notches defined in said surface and operable to permit descent of said pawl means from said restraining surface into said interdental track recesses for engagement of said teeth.

4,163,557
MOVING TARGET PRACTICE RANGE
Norvel J. McLellan, 1002 N. Main St., Pleasanton, Tex. 78064
Filed Mar. 31, 1977, Ser. No. 783,302
Int. Cl.[2] A63F 9/02; F41J 9/14
U.S. Cl. 273—101.1 **3 Claims**



1. A moving target practice range for simulating the firing of a gun using projected light on a screen comprising:
- a source of power;
- projector apparatus connected to said source of power;
- light means inside said projector apparatus receiving voltage from said source of power;
- first reflector means inside said projector apparatus for reflecting at least a portion of illumination from said light means approximately perpendicular to said screen;
- cam means driven by a motor means connected to said source of power, said cam means being operatively connected to said first reflector means to cause a substantially constant velocity sweep of said reflected illumination on said screen upon oscillation of said first reflector means by said cam means;
- gun means connected to said projector apparatus for receiving adjustments therefrom, said gun means having flash means therein connected to said source of power and trigger means of said gun means for generating a flash of light upon pulling of said trigger means;
- second reflector means in said gun means for reflecting said flash of light in approximately the same direction said gun means is pointed;
- manual adjustment means varies adjustment voltages received by vertical positioning means and horizontal positioning means, said vertical positioning means moving said second reflector means in response to said adjustment voltages to compensate for said drop, and said horizontal positioning means moving said said reflector means in response to said adjustment voltages to compensate for said lead;
- projector apparatus having automatic adjustment means connected to said cam means for varying therewith to change said adjustment from said projector apparatus to said gun means in response to angle of said reflected illumination to said screen, said adjustment changing said lead and said drop in response to said angle;
- vertical positioning means comprises a vertical solenoid means connected to a horizontal axis of a second mirror of said second reflector means, and said horizontal positioning means is a horizontal solenoid means connected to a vertical axis of said second mirror;
- manual adjustment means is located in said projector apparatus for varying said adjustment therefrom to said vertical solenoid means and horizontal solenoid means;
- automatic adjustment means are variable resistors operatively connected to said cam means, said variable resistors providing said adjustment voltage to said vertical solenoid means and said horizontal solenoid means to automatically compensate for said lead and said drop caused by increased distance to the reflected illumination as said angle changes.

4,163,558
VIBRATORY GAME APPARATUS
Eugene Jaworski, Park Ridge, and Jeffrey D. Breslow, Highland Park, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.
Filed Jan. 26, 1978, Ser. No. 872,429
Int. Cl.[2] A63B 71/04; A63F 9/00
U.S. Cl. 273—115 **12 Claims**



1. A competitive vibratory game apparatus for use with one or more game pieces movable over a playing surface in response to vibration thereof, comprising:
- an enclosure for containing said game pieces during play including a floor comprising said playing surface with an upstanding sidewall around the outer periphery of said surface;
- a plurality of compartments inwardly of said sidewall on said playing surface, each compartment including a fixed upstanding wall portion and a movable upstanding wall portion manually operable to open and close with respect to said fixed wall portion for corralling said game pieces in said compartment; and
- a plurality of selectively operable means for vibrating said playing surface, each including an elongated element having teeth along at least one edge adapted to be manipulated longitudinally with said teeth engaging a player selected portion of said sidewall for imparting player induced vibrations to various sections of said sidewall and said playing surface to control the movement of the playing pieces.

4,163,559
COMPARTMENTED CARD GAME BOX WITH REMOVABLE DRAWER
Sadie M. Stenstrom, 108 S. Mansfield St., Ironwood, Mich. 49938
Filed Oct. 3, 1977, Ser. No. 839,004
Int. Cl.[2] A63F 1/10
U.S. Cl. 273—148 A **1 Claim**

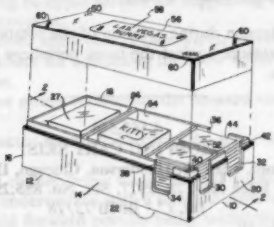
1. A card game box kit comprising, in combination, a holder including a bottom part and a cover therefore,

said cover serving as a game board and having a plurality of

marked positions thereon to serve as emplacements for placing of cards that are dealt to a plurality of players and for laying down playing cards; a pair of compartments in said bottom part,

said bottom part formed with a bottom wall joined to vertical side walls, with said compartments divided by a vertical partition and open to the top of the bottom part,

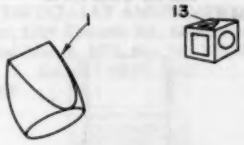
a pull out drawer detachably resting in one of said compartments, said drawer formed of a bottom wall joined to vertical side walls, with said drawer divided by at least one partition to form a plurality of compartments to serve

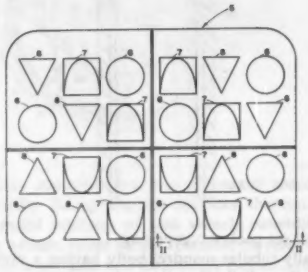


as storage space for playing cards, play money and other game accessories; with the vertical side walls of the drawer extending above the top of the bottom part so as to serve as support means for retaining the cover to the assembly of the bottom part and the drawer, in the closed position of the cover; in which said bottom part and said drawer have aligned vertical notches in a respective adjacent side wall of each, located so as to form a continuous opening, to provide access from the outside of the contents of a storage space of said drawer, in the assembled position of the drawer in the bottom part.

4,163,560
BOARD GAME
Arieh Solomon, 5, Anderson St., Ramat-Aviv, Tel-Aviv, Israel
Filed Oct. 27, 1977, Ser. No. 846,498
Claims priority, application Israel, Nov. 25, 1976, 50993
Int. Cl.[2] A63F *3/00*
U.S. Cl. 273—273 **3 Claims**

1. A board game comprising playing pieces each consisting of a body having a plurality of distinct orthogonal projection shapes and a board having sets of recesses, each set consisting of at least one recess of a shape corresponding to one of said projection shapes so that any playing piece has a like plurality of unique orientations, in each of which, it can be inserted into



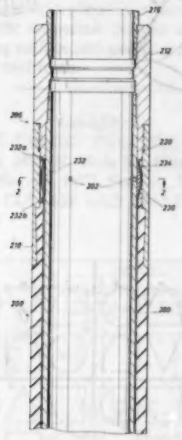


and retained by any recess of a particular set, and at least one die whose faces respectively display said shapes.

4,163,561
FATIGUE RESISTANT FITTINGS AND METHODS OF FABRICATION
Albert Q. Butler, Odessa, Tex., assignor to Dart Industries Inc., Los Angeles, Calif.
Filed Aug. 15, 1978, Ser. No. 934,227
Int. Cl.[2] B23P *11/02*; F16J *15/08*
U.S. Cl. 277—9 **14 Claims**

1. A fatigue resistant instrumentation tap and seal ring device for use in connecting sections of high pressure tubing comprising two concentric, thick-walled cylindrical shells with the outer shell being shrink-fitted onto the inner shell, said inner shell being free of threaded portions and other stress concentration points except for one or two radial bores at about midlength thereof and, axially aligned with each said radial bore, a contiguous, cleanly threaded radial aperture through said outer shell, the diameter of said threaded aperture being substantially larger than that of said radial bore but only a minor fraction of the length of said outer shell.

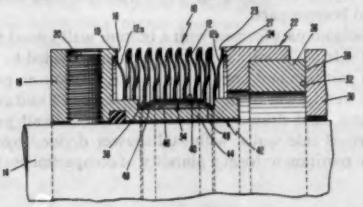
4,163,562
INFLATABLE PACKER
Lawrence Sanford, 4047 Hollister, Houston, Tex. 77055
Filed Apr. 18, 1977, Ser. No. 788,418
Int. Cl.[2] F16J *15/40*
U.S. Cl. 277—34.3 **18 Claims**



1. A fluid set packer comprising:
a generally tubular mandrel body having a port extending generally radially therethrough;
an elastomeric valve element resiliently urged against the exterior of said mandrel body, and overlying said port, and said valve element having a radially inner sealing surface for said valve element having a radially inner sealing surface for sealingly engaging said mandrel body adjacent said port, said sealing surface being substantially straight in longitudinal cross section, one axially facing free end adjacent said sealing surface, and a radially outer surface, said outer surface having one pressure reaction section adjacent said one end and radially inwardly tapered toward said one end;
a packer body carried externally of said mandrel body and comprising a pair of longitudinally spaced apart heads, one of said heads being longitudinally slidable with respect to said mandrel body, and a generally tubular radially extendable packer element interposed between said heads;
and means defining a fluid reception chamber in communication with the radially outer side of said port;
said packer body being operatively associated with said chamber and responsive to fluid pressure within said chamber to radially extend said packer element;
and said valve element being operative while overlying said port to permit fluid flow from said mandrel body through said port to said chamber but prevent fluid flow from said chamber through said port to said mandrel body.

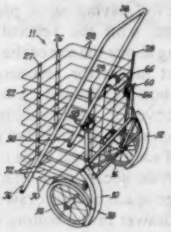
4,163,563
ROTARY BELLOWS SEAL WITH VIBRATION-DAMPING MEANS
John J. Mullaney, Warwick, R.I., assignor to Sealol, Inc., Warwick, R.I.
Filed Apr. 12, 1978, Ser. No. 895,801
Int. Cl.[2] F16J *15/36*
U.S. Cl. 277—88 **29 Claims**

1. In an apparatus having, in combination, an elongated rotatable member, an annular bellows surrounding at least a portion of the rotatable member, and means for rotating the bellows with the rotatable member, a device for damping vibration in the bellows comprising:
damping means rotating with the rotatable member and normally out of engagement with said bellows, said damping means being operable in response to the centrifugal



force thereon during rotation of the rotatable member to exert pressure against the inner periphery of the annular bellows.

4,163,564
SHOPPING CART SKIS
Walter Kramer, 1519 W. Henderson, Chicago, Ill. 60657
Filed Nov. 28, 1977, Ser. No. 855,293
Int. Cl.[2] B62B *13/18*
U.S. Cl. 280—10 **1 Claim**



1. A grocery cart for traveling on snowy or dry surfaces comprising:
a frame having a basket which has sides defining a receptacle for articles and a pair of wheels on said frame for rolling along a dry surface;
a pair of skis each movable from a stowed position adjacent a side of said cart to a sliding position under a wheel of said cart for sliding along a snowy surface;
each of said skis being located in a position above and in a plane aligned with its associated wheel and located along the sides of the basket when the skis are in the stowed position;
a carrier means interconnecting said skis at the upper ends thereof and including a brace means extending transversely between and joined to each of said skis adjacent an upper end thereof, the lower ends of said skis being free unconnected ends;
said skis each having inner curved surfaces for contacting curved surfaces of an associated wheel;
a mounting means for pivotally connecting said carrier means to said frame;
said carrier means including an articulating means pivotally connected at one end to said mounting means and pivotally connected at another end to said brace means, said articulating means being pivotal to an upward stowing position in which said another end is raised and located adjacent the rear side of said basket and to a lower position in which said another end is swung downwardly below said one end to position said skis in said sliding position, the free end of said skis engaging said wheels in said sliding position,
means operatively connected to said cart for securing said another end of said skis in said stowed position until it is desired to move them to said sliding position.

4,163,565

SNOW SKI APPARATUS AND METHOD OF MAKING IT

Robert C. Weber, Rte. 1, Box 290 BB, Ocean City, Md. 21842

Filed Jul. 27, 1977, Ser. No. 819,646
Int. Cl.[2] A63C *17/18*; B62B *13/04, 19/04*
U.S. Cl. 280—16 7 Claims

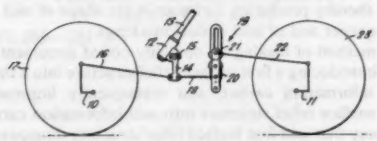
1. Snow ski apparatus comprising,
a board having an upper surface for supporting the feet of a standing occupant,
a forward runner and a rear runner which together provide an undersurface for contacting the snow when the apparatus is in use,
first connector means connecting the forward runner to said board,
second connector means connecting the rear runner to said board,
said forward runner being longitudinally symmetrical and having an undersurface with a forward portion and a rear portion, said forward portion being wider than said rear portion,
said rear runner being longitudinally symmetrical and longitudinally aligned with said front runner, said rear runner having an undersurface with a forward portion and a rear portion, said undersurface of the rear runner being wider at its rear portion than at its forward portion, said runners together providing an inwardly curved edge to facilitate turning when said board and said runners are tilted sideways.

4,163,566

STEERING MECHANISM

Geoffrey E. E. Tapp, Farnham, England, assignor to County Commercial Cars Limited, Aldershot, England

Filed Dec. 22, 1977, Ser. No. 863,575
Claims priority, application United Kingdom, Dec. 31, 1976, 54514/76
Int. Cl.[2] B62D *7/16*
U.S. Cl. 280—91 7 Claims



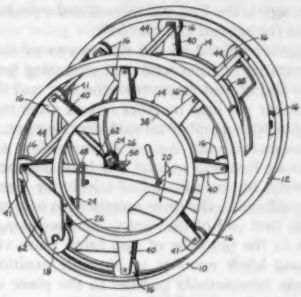
1. A steering mechanism for a vehicle having steered front and rear wheels, said mechanism comprising steering linkages for connection to both sets of wheels, the steering linkage to one set of wheels including a variable length lever and means to vary the length of the lever in response to the amount of steering movement imparted to the connection to the other set of wheels, the variable length lever comprising a lever partially mounted on a pivot, means for exerting a force on the lever to rotate the lever, and means slidably mounted on the lever for transmitting a steering force to said one set of wheels in response to rotational movement of the lever, the means to vary the length of the lever comprising a link mechanism for controlling the position of said slidably mounted force transmitting means on the lever in response to rotation of the lever, said link mechanism comprising a first link pivotally mounted at one end thereof to a fixed pivot, means to rotate the first link in response to rotation of the lever, and a second link, one end of the second link being pivotally secured to the other end of the first link and the other end of the second link being slidably mounted on the lever, the means for transmitting a steering force to the other set of wheels being connected to the other end of the second link.

4,163,567

VEHICLE, ESPECIALLY AMUSEMENT VEHICLE

Gerald L. Barber, 1209 Edwards Rd., Greenville, S.C. 29615

Filed Mar. 9, 1977, Ser. No. 775,889
Int. Cl.[2] A63G *29/02*
U.S. Cl. 280—208 16 Claims



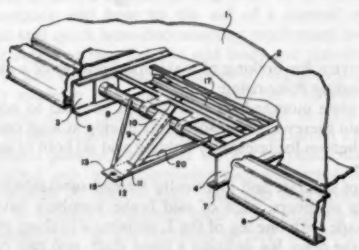
1. A vehicle comprising: a pair of coaxial spaced wheels having inwardly facing annular surfaces thereon, a frame within the radial confines of said wheels extending axially between the wheels, roller means rotatable on respective horizontal axes on the frame and distributed circumferentially on the frame in the plane of and supportingly engaging each said annular surface for rotatably supporting the frame on said wheels, seat means in the frame for seating at least one occupant, the center of gravity of said frame including any occupants seated therein being substantially lower than the common axis of said wheels, means carried by the frame and under the control of the vehicle occupant for driving at least one roller pertaining to each wheel for propelling the vehicle, a member having a pivotal connection with said frame and rotatably supporting a said drive roller at a point spaced from the pivotal connection, and spring means acting between said frame and said member for urging said member in a direction to press the drive roller thereon toward the respective wheel.

4,163,568

PIVOTABLE TRAILER HITCH

Donald D. McCumber, Owl Creek Rte., Thermopolis, Wyo. 82443

Filed Jul. 14, 1978, Ser. No. 924,740
Int. Cl.[2] B60D *1/16*
U.S. Cl. 280—491 B 1 Claim



1. A pivotable trailer hitch for an automotive vehicle having a frame with a pair of spaced parallel side beams extending along the length of the vehicle, said frame having front and rear ends, and a rear bumper affixed to the side beams at the

rear ends thereof and extending perpendicularly thereto, said pivotable trailer hitch comprising

a mounting bar rotatably affixed to the side beams of the frame in the area of the rear ends thereof and extending perpendicularly therebetween;

a hitch member having spaced opposite first and second ends, the first end of said hitch member being affixed to said mounting bar and rotatable therewith and a hitch plate extending angularly with said hitch member at the second end thereof, said hitch plate having spaced opposite first and second ends with a hitch pin hole formed therethrough at the first end thereof and a pin hole formed therein at the second end thereof;

a cross member affixed to the side beams of the frame in spaced parallel relation with said mounting bar closer to the front end of said frame than the rear end thereof;

a cross member pin hole member in said cross member;

a bumper pin hole member on said rear bumper; and

a brace member having spaced opposite first and second ends having first and second pin hole members thereat, respectively, the second end of said brace member being pivotally affixed to the cross member pin hole member via a pin, the first end of said brace member being pivotally affixable to the pin hole of said hitch plate via a pin to secure said hitch member in operable position with its hitch plate substantially parallel to the plane of the side beams of the frame and below said frame and extending rearward of the rear bumper, said hitch member being releasable from said brace member and rotatable with said mounting bar to a retracted position in which said hitch plate abuts said cross member, and the first end of said brace member being pivotally affixable to the bumper pin hole member via a pin whereby said brace member supports said hitch member in the retracted position of said hitch member.

4,163,569

SKI BRAKE

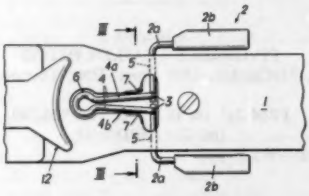
Hans Horn, Wellington, New Zealand, assignor to TMC Corporation, Baar, Switzerland

Continuation of Ser. No. 720,211, Sep. 3, 1976, abandoned. This application Mar. 6, 1978, Ser. No. 883,836

Claims priority, application Austria, Sep. 23, 1975, 7266/75

Int. Cl.[2] A63C *7/10*

U.S. Cl. 280—605 **5 Claims**



1. A device for braking of a ski upon release of a ski boot from a binding comprising:

a sole plate mounted on said ski and adapted to normally remain therewith, said sole plate having at least one binding thereon for releasably holding said ski boot to said sole plate;

a pair of separate and identically formed substantially rigid brake members, each of said brake members having an L-shape with one leg of the L defining a braking mandrel and the other leg defining a pivot shaft, said pair of pivot shafts extending generally horizontally and transversely to the longitudinal axis of said ski;

bearing means on said sole plate for supporting said pivot shafts for both an axial movement and a rotatable movement;

a bifurcated spring wire tensioning lever having a pair of resilient legs fixedly connected to said pivot shafts, and being pivotal therewith between a first upright position transverse to the longitudinal axis of said ski and a second position generally parallel to the longitudinal axis of said ski, said legs being flexible from a normal relaxed position inwardly toward each other and a tensioned position;

cam means on said sole plate engaging said legs of said tensioning lever while in said tensioned position for continually urging said tensioning lever from said second position toward said first position whereat said legs are in said relaxed position; and

means defining a cavity in the upper surface of said sole plate wholly receiving said tensioning lever therein when in the tensioned position thereof whereby said ski boot rests directly on said sole plate.

4,163,570

OPTICALLY CODED DOCUMENT AND METHOD OF MAKING SAME

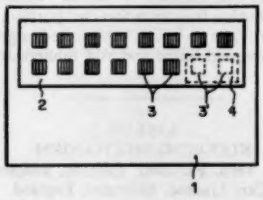
David L. Greenaway, Oberwil, Switzerland, assignor to LGZ Landis & Gyr Zug AG, Zug, Switzerland

Filed Nov. 7, 1977, Ser. No. 848,871

Claims priority, application Switzerland, Dec. 21, 1976, 16084/76

Int. Cl.[2] B42D *15/00*

U.S. Cl. 283—8 A **7 Claims**



1. A document comprising an information carrier on which information is recorded in the form of optical markings, wherein said information carrier has a shape-memorizing capability to memorize the shape of a relief structure, said capability being operable by supplying energy to said information carrier, thereby producing a change in the shape of said information carrier and of said optical markings.

6. A method of making an optically coded document comprising introducing a first surface relief structure into a thermoplastic information carrier, and subsequently impressing a second surface relief structure into said information carrier in such a way that said first surface relief structure disappears and is converted into an elastic stress field.

4,163,571

PIPE COUPLINGS

David D. Nash, Brownhills West, England, assignor to Durapipe Limited, Cannock, England

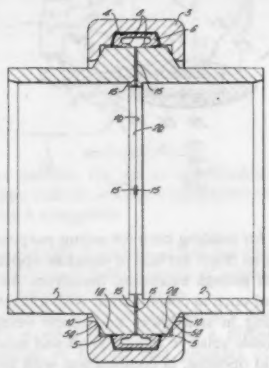
Filed Jul. 18, 1977, Ser. No. 816,642

Int. Cl.[2] F16L *17/04*

U.S. Cl. 285—106 **7 Claims**

1. A pipe coupling comprising two tubular parts each provided with a flange at one end, a clamping ring having an internal groove adapted to receive the flanges when the two tubular parts are disposed in end to end relationship with their flanges together, the coupling including an annular seal adapted to provide sealing between the tubular parts, and wherein each of said flanges, in axial section through the respective tubular part, on its side which faces away from said one end of the tubular part, slopes outwardly from the periphery of the tubular part towards said one end thereof, and wherein said internal groove in the clamping ring has side

walls defining the axial limits of the groove, which over their regions furthest from the axis of the coupling and thus nearest the bottom of said internal groove, extend more steeply, with respect to the axis of the coupling, than said sloping sides of said flanges and which side walls, in axial section through the coupling, are radiused in the region of their free edges, whereby said side walls flare towards the edges of the groove and, over their regions nearest the axis of the coupling and thus furthest from the bottom of said internal groove, extend less



steeply with respect to the axis of the coupling than said sloping sides of said flanges, whereby when the clamping ring is tensioned circumferentially, each said side wall of the groove engages the sloping side of the respective flange only along a continuous line of contact of the radiused part of the groove side wall with the respective flange and whereby when the coupling is assembled, a circumferential tension in the clamping ring produces a wedging action urging one flange into engagement, via the end face of its flange, with the end of the other flange.

4,163,572

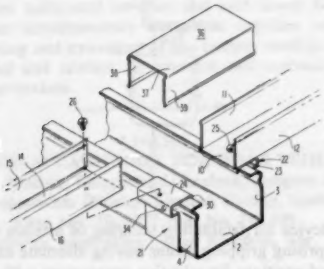
TRANSITION FITTING

Richard D. Benscoter, Parkersburg, W. Va., assignor to Textron Inc., Providence, R.I.

Filed Nov. 7, 1977, Ser. No. 848,804

Int. Cl.[2] F16L *55/00*

U.S. Cl. 285—121 **5 Claims**



1. In an overhead raceway system having a feeder duct and a pair of transverse branch ducts, each duct being channel shaped with a removable cover across the channel opening, improved transition means for the transfer of power/communication conductors from the feeder duct to the branch ducts comprising:

a first branch duct coupling having clamp means engaging the inside and the outside of one wall of the feeder duct and a screw threaded in the clamp means and engaging the outside of said one wall of the feeder duct, the screw being turned in to cause said engagement of the clamp means to secure the coupling in position and the coupling having a platform section supporting one of the branch ducts with the bottom of said one duct at the top of the feeder duct;

a screw securing the bottom of said one branch duct to said platform section;

a second branch duct coupling having clamp means engaging the inside and the outside of the other wall of the feeder duct and a screw threaded in the clamp means and engaging the outside of said other wall of the feeder duct, the screw being turned in to cause said engagement of the clamp means to secure the coupling in position and the coupling having a platform section supporting the other branch duct with the bottom of the other branch duct at the top of the feeder duct;

a screw securing the bottom of said other branch duct to the last said platform section; and

a channel shaped cover extending between the branch ducts and being removably secured thereto by that the opposite ends of the cover walls extend over and engage the walls of the respective branch ducts.

4,163,573

HOSE FITTING

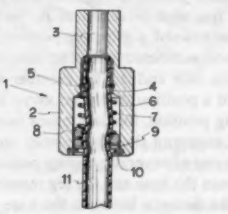
Kazuo Yano, Tokyo, Japan, assignor to Chiyoda Tsusho K.K., Tokyo, Japan

Filed Feb. 28, 1978, Ser. No. 882,198

Claims priority, application Japan, Feb. 28, 1977, 52/021309; Aug. 31, 1977, 52/115763[U]

Int. Cl.[2] F16L *55/00*

U.S. Cl. 285—174 **4 Claims**



1. A hose fitting comprising a body provided therein with a longitudinal fluid passage adapted to receive a hose through the outlet thereof, an O-ring provided on the surrounding wall of said fluid passage and in the vicinity of the inlet thereof so as to give water- or - air-tightness to a spaced formed between the outside surface of the hose inserted in said fluid passage and the surrounding wall thereof, and a quick hose-disconnecting mechanism provided between said O-ring and the outlet of said fluid passage for receiving said hose therethrough, gripping said hose in such a manner as to prevent reverse motion and disconnecting said hose by the aid of a manual operation, wherein said quick hose-disconnecting mechanism includes an annular retaining ring fixed to said body and provided at the outlet of said fluid passage, an inclined ring provided on said annular retaining ring and supporated thereby said inclined ring having at the end thereof opposite said annular retaining ring a surface inclined relative to the longitudinal axis of said longitudinal passage, and a flat surface perpendicular to said longitudinal axis, a hose-gripping ring supported on the inclined surface of said inclined ring, said hose gripping ring having an internal cylindrical surface for gripping said hose, when supported on said inclinded surface, said hose-gripping ring being adapted to rotate about its diametral direction and a coil spring in engagement with said hose-gripping ring and said body for at all times urging said hose-gripping ring against said inclined surface of said inclined ring;

whereby said hose-gripping ring is pivotable on said inclined ring at an intersection of said inclined surface and said flat

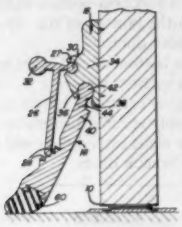
surface to move said internal cylindrical surface out of hose gripping engagement to enable insertion and removal of said hose in said fitting.

4,163,574

DOOR STOP FOR INWARD OPENING DOOR

Jimmie A. Chezem, Rte. 9, Box 164A, Sparta, Tenn. 38583

Filed Mar. 17, 1978, Ser. No. 887,671
Int. Cl.[2] E05C 3/12
U.S. Cl. 292—338 3 Claims



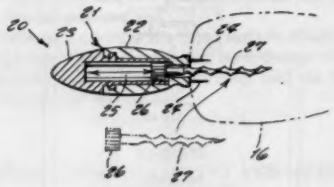
1. For use on the interior surface of a closure, an occupant safeguarding stop including a base securely mountable on an interior surface of an associated closure in a position adjacent but spaced from a jamb of the closure, a rigid leg member including base and free ends and aligned with and having its base end pivotally joined to the base and having a pressure portion on its free end arranged to be forcibly pressed and readily actuated toward a gripping position engaged with an abutment surface associated with the closure, resilient means connected to the base and the leg member for biasing the leg member toward a position displaced away from the abutment surface gripping position, locking means mounted on the base for selectively engaging the leg member and holding the leg member in any one of several gripping positions depending on the angle between the base and the leg member, which angle is a function of the distance between the base and the abutment surface, said locking means including an elongated element having one end pivotally mounted on the base with its other end extending toward the leg member, a plurality of recesses provided on the leg member at points spaced therealong and arranged for selectively receiving a terminal end portion of the other end of said element and retaining the leg member in the gripping position, the exact recess receiving the terminal end portion of the elongated element being a function of the distance between the base and the abutment surface and the desired deflection of the element, said base having a pair of parallel elongated slots formed therein including opposite ends opening endwise outwardly of remote surfaces of said base, said slots including narrow outer longitudinal portions opening laterally outwardly of a side of said base extending between said remote surfaces, the inner portions of said slots being widened and of partial cylindrical configuration, said one end of said elongated element and said base end of said leg member including transverse partial cylindrical portions extending transversely thereof and supported from said element and leg member by narrow neck portions, said element and leg member partial cylindrical portions being lengthwise received in the inner portions of said slots with said neck portions loosely received through said narrow outer slot portions, said leg member partial cylindrical portion including a first end thereof terminating inwardly of the corresponding end of the associated slot, said resilient means including a coil spring disposed within said end of said associated slot and including spring ends engaged with said leg member and base.

4,163,575

CORNSCREW

Larry P. Riedinger, Jr., c/o Geo. Spector, 3615 Woolworth Bldg., 233 Broadway, and George Spector, 3615 Woolworth Bldg., 233 Broadway, both of New York, N.Y. 10007

Filed Aug. 29, 1977, Ser. No. 828,775
Int. Cl.[2] A47G 21/00
U.S. Cl. 294—5 2 Claims



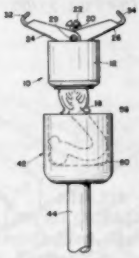
1. A device for holding corn for eating purposes comprising a knob having an outer surface of cornlike appearance and an inner end with prongs extending therefrom for piercing the end of an ear of corn in combination with a screw mounted in an axial opening in said knob, said screw being axially and rotatably movable relative to said knob and extending axially outward of said opening, in combination with means mounted on said knob engaging said screw for rotating and moving said screw axially relative to said knob opening.

4,163,576

MEANS FOR SUSPENDING ARTICLES FROM A CEILING

James B. Hoop, 8127 E. 12th-Apt. 2, Tulsa, Okla. 74112

Filed Apr. 24, 1978, Ser. No. 899,386
Int. Cl.[2] A47F 13/06
U.S. Cl. 294—19 R 8 Claims



1. A device for facilitating securing of articles to a ceiling and comprising gripping means having alternate extended and contracted positions for selective engagement with the ceiling, sleeve means secured to said gripping means and reciprocal with respect thereto and having one end engageable with the gripping means for providing said extended and contracted positions therefor, hook means carried by said sleeve for receiving said article thereon, and tool means cooperating with the hook means for providing reciprocal movement for the sleeve means from a position remote with respect to the ceiling, and including threaded means for securing the sleeve means to the gripping means to provide said reciprocal movement therefor.

4,163,577

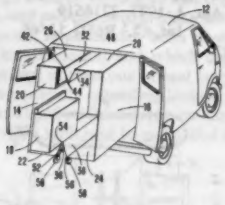
CAMPER MODULE

Ira C. Vanderslice, 100 Callie Ct., Loveland, Colo. 80537

Filed May 12, 1978, Ser. No. 905,191

Int. Cl.[2] B60P *3/34*

U.S. Cl. 296—164 10 Claims



1. A camper module, for use in combination with a rear opening van-type vehicle to form a temporary room-like interior thereof which comprises:

a frame;

said frame including a first vertical side and a second vertical side opposite to each other capable of supporting a fixture means for relaxation and storage;

an upper horizontal member containing a plurality of sections; said sections connected by a plurality of hinge means capable of folding said plurality of sections together;

said upper horizontal member having a first end and a second end, said first end is affixed to said first vertical side, and said second end is affixed to said second vertical side forming a ceiling in an extended position;

a lower horizontal member having a first end and a second end;

said first end is affixed to said first vertical side at the opposite end in which said upper horizontal member is affixed and said second end is affixed to said second vertical side at the opposite end in which said upper horizontal member is affixed containing a plurality of sections forming a floor in said extended position;

said plurality of sections is connected by a plurality of hinge means capable of folding said plurality of sections together;

a plurality of foldable support means affixed to said lower horizontal members so that when said lower member is folded, said foldable support means is extended from a collapsed position to an erect position, permitting movement of said camper module;

said upper horizontal member and said lower horizontal member simultaneously cooperate together to permit collapsing and extending of the camper module for easy removal and storage or insertion and erection of said camper module.

4,163,578

MAIN FRAME ASSEMBLY FOR ROAD VEHICLES

Norman F. Watson, Chipperfield, England, assignor to Stonefield Developments (Paisley) Limited, Paisley, Scotland

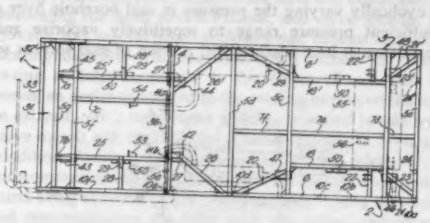
Filed Apr. 19, 1977, Ser. No. 788,999

Claims priority, application United Kingdom, Apr. 20, 1976, 15921/76

Int. Cl.[2] B62D *27/00*

U.S. Cl. 296—204 7 Claims

1. A main frame assembly for a road vehicle comprising two parallel spaced side frames each comprising a continuous upper beam and a plurality of interconnected lower beams, connecting members free of diagonal bracing connecting said upper beam of each side frame to said lower beams of the side frame, cross members free of diagonal bracing connecting said lower beams of one of said two side frames to said lower beams of the other of said side frames, said cross members being spaced apart along the length of said side frames, and means connecting together said upper beams adjacent their forward end only so as to define a generally U-shaped load space open



at one end, and means spacing one of said lower beams of each side frame inwardly from the others to define a wheel recess.

4,163,579

REINFORCING INSERT FOR A SUNVISOR FOR VEHICLES

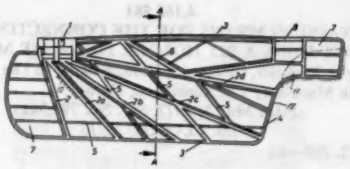
Gert Mahler, Radevormwald; Lothar Viertel, Wuppertal, and Wolfgang Meissner, Wetter, all of Fed. Rep. of Germany, assignors to Gebr. Happich GmbH, Wuppertal, Fed. Rep. of Germany

Filed Jun. 17, 1977, Ser. No. 807,586

Claims priority, application Fed. Rep. of Germany, Jul. 22, 1976, 2633002

Int. Cl.[2] B60J *3/00*

U.S. Cl. 296—97 H 9 Claims



1. A sun visor for a vehicle, including a visor body and a reinforcing insert inserted in said visor body; said reinforcing insert being comprised of a plastic material;

said body having a number of side edges and having surfaces joining said side edges; a pivot bearing for said visor body and located at one said side edge and near an intersecting one of said side edges;

said reinforcing insert comprising a plurality of tension stays extending from said pivot bearing along different respective pathways that widen apart moving away from said pivot bearing to respective regions of said reinforcing insert; said regions being at the side of said body away from and diametrally opposite said pivot bearings;

said tension stay pathways start from said pivot bearing and widen radially as they extend to said diametrally opposite regions.

4,163,580

PRESSURE SWING RECOVERY SYSTEM FOR MINERAL DEPOSITS

Durk J. Pearson, Palos Verdes Estates, and Jack R. Bohn, Rancho Palos Verdes, both of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Continuation-in-part of Ser. No. 741,637, Nov. 15, 1976, Pat. No. 4,059,308. This application Nov. 21, 1977, Ser. No. 853,661

Int. Cl.[2] E21B *43/28, 43/25*

U.S. Cl. 299—5 26 Claims

1. In a process for the recovery of minerals from a subterranean mineral deposit which includes at least one soluble mineral, the steps of:

(a) drilling at least one borehole through which fluids may be introduced into said deposit;

(b) introducing into said borehole a quantity of a predetermined solvent suitable for dissolving said mineral;

(c) cyclically varying the pressure in said borehole over a sufficient pressure range to repetitively vaporize and condense at least a substantial portion of said solvent so

that vaporization of said solvent in the pores and cracks of said deposit is effective to drive solute out of the pores and cracks; and

(d) extracting a solution of said mineral from said mineral deposit.

4,163,581

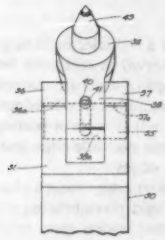
RETAINING MEANS FOR THE CONNECTING PIN WHICH JOINS A BIT HOLDER TO A BASE MEMBER

Claude B. Krekeler, Cincinnati, Ohio, assignor to The Cincinnati Mine Machinery Co., Cincinnati, Ohio

Filed May 4, 1977, Ser. No. 793,541

Int. Cl.² E21C 35/18

U.S. Cl. 299—91 **9 Claims**



1. In a mining machine and the like having at least one driven element adapted to advance a cutter bit assembly in a cutting direction, said assembly comprising a base member affixed to said driven element, a bit holder, and a connecting pin located within aligned holes in said base member and said bit holder whereby to join said bit holder to said base member, the joined bit holder and bit member having cooperating abutment surfaces to sustain some of the resultant cutting forces encountered during mining operations, the improvement which comprises: said connecting pin being located wholly within the joined bit holder and base member; a retaining pin for said connecting pin to retain said connecting pin within said joined bit holder and base member; and structure to permit insertion of said retaining pin into said connecting pin after said connecting pin has been located within said joined bit holder and base member; said retaining pin also being located wholly within the confines of said joined bit holder and base member, said retaining pin being specifically located completely within said connecting pin and said bit holder free of said base member.

4,163,582

PNEUMATIC STOWING APPARATUS

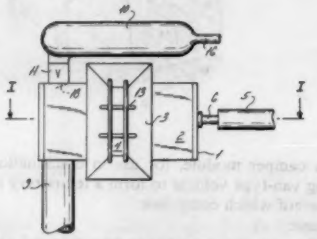
Kurt H. Voss, Hattingen, Fed. Rep. of Germany, assignor to Bergwerksverband GmbH, Essen, Fed. Rep. of Germany

Filed Jan. 6, 1978, Ser. No. 867,511

Claims priority, application Fed. Rep. of Germany, Jan. 8, 1977, 2700675; Apr. 1, 1977, 2714619

Int. Cl.² B65G 53/46

U.S. Cl. 406—12 **15 Claims**



1. A pneumatic stowing apparatus, especially for filling up dams in an underground mine gallery by blowing rough mine waste resulting from blasting operations during advance of a mine gallery by means of compressed air to a point of use, said apparatus comprising a substantially closed housing having a top wall provided with an inlet opening and a pair of end walls each provided with at least one opening aligned with the opening in the other end wall; at least one discharge conduit communicating with the interior of said housing through the opening provided in one of the end walls thereof; means forming at least one elongated chamber having opposite open ends adjacent to the end walls of said housing and being movable in the interior of said housing between a material receiving position in which said chamber is aligned with said inlet opening to receive mine waste passing through said inlet opening and a discharge position in which said opposite open ends are respectively aligned with said openings in said end walls; means connected to said chamber forming means to move the latter between said positions thereof; and means for blowing off mine waste out of said chamber into said discharge conduit to be transported through the latter to a point of use, said blowing-off means including an air accumulator for accumulating compressed air, an air conduit communicating at one end with one end of said air accumulator and at the other end with the interior of said housing through said opening in the other end wall thereof, quickly opening and closing valve means in said air conduit, and a contact member which is actuated by direct contact with said chamber forming means so as to open and close said valve means in sequence with the movement of said chamber forming means so that in said discharge position of said chamber forming means the latter actuates said contact member whereby said valve means quickly opens and the compressed air accumulated in said air accumulator enters with a sudden burst through said air conduit into said chamber and blows off mine waste out of the latter into said discharge conduit.

4,163,583

PNEUMATIC HOPPER OUTLET CAP LATCH

James C. Hammonds, St. Charles, Mo., assignor to ACF Industries, Incorporated, New York, N.Y.

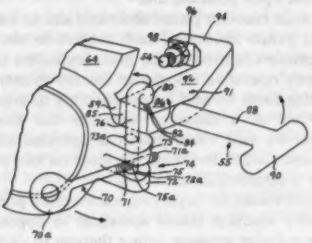
Filed Oct. 25, 1977, Ser. No. 844,666

Int. Cl.² B61D 7/02, 7/28, 49/00; B65G 53/50

U.S. Cl. 406—198 **7 Claims**

1. A hopper outlet comprising: hopper outlet walls extending downwardly having inner ends which define a discharge opening; a discharge conduit extending below said discharge opening; at least one valve element located within said discharge opening being movable between a first position closing

said discharge opening, and a second position allowing communication between said discharge opening and said discharge conduit; said valve element having an operating shaft extending generally parallel to said discharge conduit; said shaft having an operating handle located outside of said hopper walls; said discharge conduit having an end cap covering said discharge conduit; said end cap held in place with at least a pair of transversely spaced, large headed bolts pivotably mounted adjacent said discharge conduit and which engage at least a portion of said end cap; at least one of said large headed bolts being attached to a vertically extending locking member rotatably mounted on a side of said discharge conduit; said locking member being movable with said large headed bolt; said locking member having an upper locking portion of generally an inverted "J" shape; said upper locking portion having a lower locking surface adjacent to and overlying said operating handle when said handle is in the position which corresponds to the fully closed position of said valve element, whereby said locking surface prevents movement of said operating handle and said valve element from the closed position; and whereby if said valve element and its operating shaft are in an open position, said operating handle provides an obstruction for said locking member and prevents said locking member from assuming a position overlying said operating handle, and said one large headed bolt is prevented from pivoting into a position to hold the end cap in closed position.

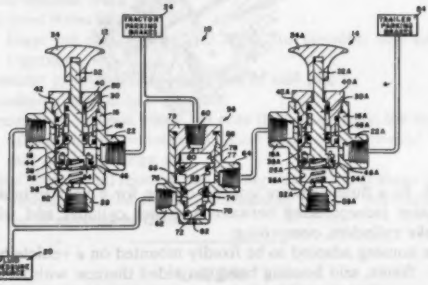


4,163,584

FLUID PRESSURE BRAKING SYSTEM

James P. Koenig, Olmsted Township, Cuyahoga County, Ohio, assignor to The Bendix Corporation, Southfield, Mich.

Filed Feb. 17, 1978, Ser. No. 878,840
Int. Cl.[2] B60T *13/00*
U.S. Cl. 303—7 **18 Claims**



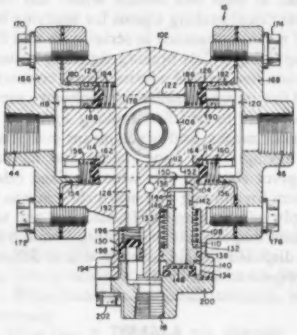
1. In a fluid pressure braking system for an articulated vehicle comprising a tractor and a trailer, said tractor and trailer each having fluid pressure released parking brakes, a fluid pressure source, a control arrangement for controlling fluid communication from said source to said parking brakes including first valve means having an inlet connected to said source, an outlet connected to the parking brakes on the tractor, an exhaust, a valve member slidably mounted in said first valve means and operable for manual movement from a first position closing communication between the inlet and outlet and communicating the latter to said exhaust, said valve member being movable to a second position closing said exhaust and communicating the inlet with the outlet, and second valve means having an inlet connected to the outlet of said first valve means, an outlet connected to the parking brakes on the trailer, an exhaust, valve mechanism slidably mounted in said second valve means and operable for manual movement from a first condition closing communication between the inlet and outlet and communicating the latter to said exhaust, said valve mechanism being movable to a second condition closing said exhaust and communicating the inlet with the outlet, and structure responsive to the pressure level within such second valve means for yieldably urging said valve mechanism to said condition when said pressure level drops below a predetermined level.

4,163,585

SERVICE AND EMERGENCY TRAILER VALVE

John M. Ury, Hazelwood, Mo., assignor to Wagner Electric Corporation, St. Louis, Mo.

Continuation of Ser. No. 794,301, May 5, 1977, Pat. No. 4,080,004, which is a continuation of Ser. No. 677,405, Apr. 15, 1976, Pat. No. 4,042,281. This application Feb. 21, 1978, Ser. No. 879,082
Int. Cl.[2] B60T *15/02*
U.S. Cl. 303—9 **16 Claims**



14. A valve for controlling air pressure in a towed vehicle air brake system which system includes an air pressure supply means which receives air from an external source of air supply, service brake means and parking brake means and only a first and a second air pressure storage means for supplying air pressure to said service brake means and parking brake means, said valve comprising:

(a) first air pressure passage means for supplying air pressure to said first and second air pressure storage means;

(b) second air pressure means for supplying air pressure from said first and second storage means to said parking brake means;

(c) unidirectional check valve means in said first and second air pressure passage means for preventing air pressure from flowing from either one of said air pressure storage means into the other and for preventing air pressure from flowing from either one of said air pressure storage means through said first air pressure passage means and out of the valve and for selectively selecting and supplying air pressure to said parking brake means from that one of the first and second air pressure storage means with the higher air pressure and for preventing the selected air pressure from returning to either one of said air pressure storage means; and

(d) pressure responsive valve means responsive to the pressure of said air supply means said pressure responsive

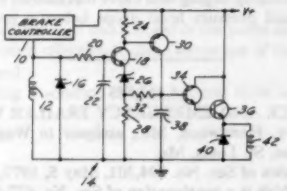
valve means having a valve member in said second air pressure passage means for controlling the application of air pressure from said second air pressure passage means to said parking brake means and for exhausting air pressure from said parking brake means to the atmosphere.

4,163,586

CONTROL SYSTEM FOR DOUBLE-ACTUATOR BRAKES

Robert C. Snyder, Country Club Hills, Ill., assignor to Motor Wheel Corporation, Lansing, Mich.

Filed Nov. 25, 1977, Ser. No. 854,649
Int. Cl.[2] B60T *13/74*
U.S. Cl. 303—20 7 Claims



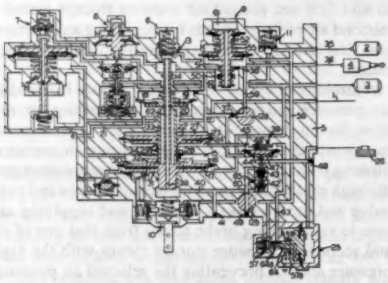
1. A brake control system for use on a wheeled vehicle system having at least one braked wheel comprising brake means having first and second separately actuatable electrically-operated brake actuator means disposed to apply braking forces at said at least one braked wheel and responsive to respective electrical braking signals for applying brake forces, first control means connected in series with said first actuator means for applying a first braking signal to actuate said first actuator means, and second control means connected in parallel with said first actuator means for applying a second braking signal proportional to said first braking signal to actuate said second actuator means, said brake means comprising an electric brake having brake shoe means and an actuator arm adapted to pivot about an axis which is fixed relative to said vehicle system for moving said brake shoe means into a brake drum to apply said braking forces, said first and second brake actuator means respectively comprising first and second electromagnets disposed on said actuator arm at differing moment radii with respect to said axis.

4,163,587

PNEUMATIC RAILWAY BRAKING DISTRIBUTOR

Henri Limozin, Claye Souilly, and Georges Dalibout, Gagny, both of France, assignors to WABCO Westinghouse, Freinville-Sevran, France

Filed Dec. 8, 1977, Ser. No. 858,489
Int. Cl.[2] B60T *8/18*
U.S. Cl. 303—22 R 13 Claims



1. A fluid pressure distributor for a railway vehicle including a control valve device operative responsive to the variation of fluid pressure in a brake pipe of the vehicle to control the vehicle brake pressure, said control valve device comprising:

(a) supply valve means for admitting fluid under pressure to the vehicle brake cylinders in an open position and for interrupting the admission of fluid under pressure to the brake cylinders in a closed position; and

(b) a piston assembly to effect operation of said valve means including:

(i) a control piston abutment subject opposingly to the fluid pressure of a brake pipe and a control reservoir in response to which an actuating force is exerted by the differential pressure therebetween to urge said piston assembly in a first direction to operate said valve means to the open position; and

(ii) a main reaction piston abutment and an auxiliary reaction piston abutment, each subject to the fluid under pressure admitted to the brake cylinders and independently operative responsive thereto to exert a counteracting force on said piston assembly to urge movement thereof in a direction opposite the first direction, whereby said valve means is operated to the closed position when the actuating force on said piston assembly is counterbalanced; and

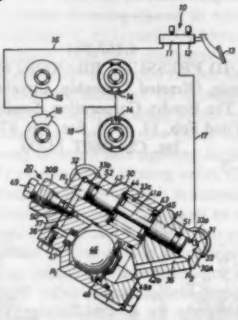
(c) control means for supplying a correction pressure to said auxiliary reaction piston abutment in opposition to the brake cylinder pressure acting thereon to vary the degree of counteracting force exerted by said reaction piston on said piston assembly and thereby modify the brake cylinder fluid pressure in accordance with a vehicle parameter to which said control means is responsive.

4,163,588

FLUID PRESSURE CONTROL DEVICE FOR VEHICLE BRAKING SYSTEMS

Tomoyuki Nogami, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Feb. 16, 1978, Ser. No. 878,596
Claims priority, application Japan, Feb. 21, 1977, 52-20694[U]
Int. Cl.[2] B60T *8/14, 8/22*
U.S. Cl. 303—24 C 3 Claims



1. In a fluid pressure control device for a vehicle braking system incorporating between a master cylinder and wheel brake cylinders, comprising:

a housing adapted to be fixedly mounted on a vehicle body frame, said housing being provided thereon with an inlet port for connection to said master cylinder and an outlet port for connection to said wheel brake cylinders and being provided therein with a stepped bore having a small diameter portion and a large diameter portion, said bore being in communication with said inlet and outlet ports respectively at the small and large diameter portions thereof, and a first chamber in communication with the small and large diameter portions of said stepped bore at opposite sides thereof;

a differential piston having small and large diameter portions slidably disposed within the respective small and large diameter portions of said stepped bore to provide second and third chambers respectively in open communcation with said inlet and outlet ports, said piston being exposed at its small diameter portion in said second chamber and at its large diameter portion in said third chamber;

a spring loading said piston axially in a direction toward said outlet port; and

cut-off valve means including a valve seat provided on a wall of said first chamber to permit fluid flow between said second and third chambers and an inertia-controlled ball housed within said first chamber to co-operate with said valve seat to cut off fluid flow from said second chamber to said third chamber when said ball is subjected to a deceleration in excess of a predetermined value;

the improvement wherein said housing includes a space between the small and large diameter portions of said stepped bore, and said spring is housed within said space between the small and large diameter portions of said stepped bore and is detachably engaged at opposite ends thereof with the small and large diameter portions of said piston, whereby said piston is loaded toward said outlet port by engagement with said spring when moved toward said inlet port and loaded toward said inlet port by engagement with said spring when moved toward said outlet port.

4,163,589

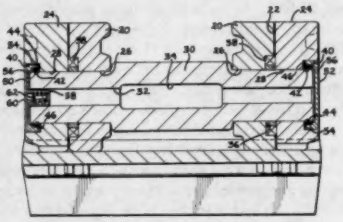
HINGE JOINT FOR TRACK LINK ASSEMBLIES

Lawrence E. Fox, Peoria, and James R. Shuler, Eureka, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Apr. 24, 1978, Ser. No. 899,771

Int. Cl.[2] B62D *55/20*

U.S. Cl. 305—14 **8 Claims**



1. A track link assembly comprising:

two meshed track links;

aligned bores in said links;

a hinge pin received in said bores for pivoting said links together;

annular grooves at opposite ends of said pin;

retaining rings in said grooves;

recesses in one link about the bore therein adjacent the ends of said pin and defining shoulders substantially abutted by said retaining rings; and

caps closing said recesses and having axial portions about the periphery of the respective retaining ring for preventing radial movement thereof.

4,163,590

UNIVERSAL FLOATING GUIDE MEANS

Gregory J. Dwyer, Livonia, and Ivan L. Kauffman, Commerce Township, Oakland County, both of Mich., assignors to Ex-Cell-O Corporation, Troy, Mich.

Filed Apr. 12, 1977, Ser. No. 731,172

Int. Cl.[2] F16C *23/02*

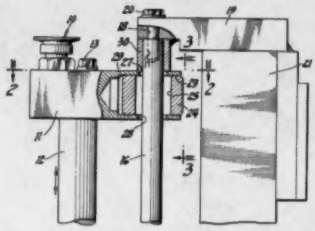
U.S. Cl. 308—3 R **5 Claims**

1. In a guide means for guiding a linearly movable slide member, the combination comprising:

(a) a fixed guide rod;

(b) the slide member being provided with a bore formed on an axis perpendicular to the direction of movement and the longitudinal axis of the guide rod;

(c) a pair of aligned bores formed through the slide member and communicating with said first mentioned bore for reception of the guide rod, and being made to a diameter



larger than the diameter of the guide rod and disposed concentric to the guide rod;

(d) a bushing slidably mounted in the first mentioned bore in the slide member and having a cross-hole therethrough, through which the guide rod is movably mounted, whereby when the slide member is moved longitudinally of the guide rod, the bushing may float relative to the slide member and the guide rod.

4,163,591

FLEXIBLE COVERING FOR POWER SUPPLY LINES, GUIDEWAYS AND THE LIKE

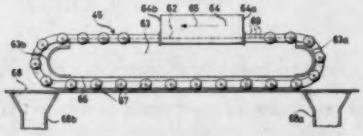
Kurt Hennig, Georgensteinstr. 16, 8000 Munich 71, and Manfred Klein, Böhmerwaldstr. 11, 8045 Ismaning, both of Fed. Rep. of Germany

Filed Dec. 9, 1977, Ser. No. 859,045

Claims priority, application Fed. Rep. of Germany, Dec. 14, 1976, 2656622

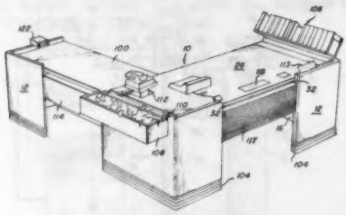
Int. Cl.[2] B23Q *11/08;* H02G *11/00*

U.S. Cl. 308—3.5 **16 Claims**



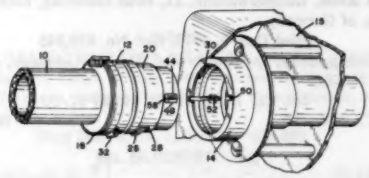
1. A flexible cover comprising two laterally spaced flexible chains, each of which is composed of links connected by hinge pins, the links of the chains forming lateral sides of adjacent sections of said cover, each link of one chain being connected to an opposite link of the other chain, at least at the top, by a rigid cover member to connect said lateral sides of the cover sections, the rigid cover members defining arcuate end sections which are in sliding contact with the end sections of adjacent cover sections, an arcuate end section of each rigid cover member overlapping the end section of the adjacent cover section with which it is in sliding contact, and adjacent cover sections also being provided with opposed stops which limit the angle of relative pivoting of such adjacent cover sections.

4,163,592
FURNITURE UNITS WITH L-SHAPED PANEL SUPPORTS
George H. Nelson, New York, N.Y., assignor to George Nelson & Company, New York, N.Y.
Filed Oct. 12, 1977, Ser. No. 841,418
Int. Cl.[2] A47B 27/00
U.S. Cl. 312—194 8 Claims



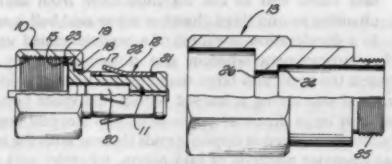
1. A universal component part for articles of furniture, said component part comprising a generally L-shaped free standing panel having upper and lower horizontal edges and left and right vertical edges, said panel comprising two generally planar members and elongated members seated in peripheral recesses formed in the exterior edges of said planar members and defining with said planar members and internal cavity, said panel having a first set of slots formed in the peripheral edges of said elongated members seated in the horizontal edges of said planar members and a second set of slots formed in the peripheral edges of said elongated members seated in the vertical edges of said planar members, said slots being sized and shaped to receive brackets which extend into said internal cavity and support other component parts of said articles of furniture.

4,163,593
SEPARABLE HOSE COUPLING
John Kosik, Stamford, Conn., assignor to Consolidated Foods Corporation, Old Greenwich, Conn.
Filed Sep. 22, 1977, Ser. No. 835,545
Int. Cl.[2] H01R 3/04
U.S. Cl. 339—15 1 Claim



1. In a separable connector for connecting a hose to a vacuum cleaner and for establishing an electric circuit between the hose and the cleaner, an inner sleeve of electrical insulating material, means for securing said sleeve to the outer surface at one end of the hose, said sleeve being formed with an outwardly extending flange at one end thereof, an outer metallic sleeve around said inner sleeve with one end thereof abutting against said flange, radial projections on one of said sleeves for spacing said sleeves apart to provide an annular space therebetween, manually retractable latch members disposed in said space and projecting through openings in said outer sleeve for releasably engaging surfaces on said vacuum cleaner, a pair of electric contacts carried by said inner sleeve and extending in spaced relation through apertures in said outer metallic sleeve, lugs of insulating material extending from said inner sleeve into said apertures at the ends of the latter adjacent to said flange for providing an insulation barrier between said contacts and the metal of said outer sleeve at said ends of the apertures and an axially extending projection from said flange engaging a recess in the adjacent end of said outer sleeve to prevent relative rotation between the two sleeves, whereby said contacts are prevented from touching the edges of said apertues in the outer metallic sleeve.

4,163,594
ELECTRICAL CONNECTOR
Sharanjit S. Aujla, Whitby, Canada, assignor to International Telephone and Telegraph Company, New York, N.Y.
Filed Jul. 28, 1978, Ser. No. 928,999
Int. Cl.[2] H01R 13/54
U.S. Cl. 339—82 4 Claims



1. A tamper-proof electrical connector comprising: a termination unit including means at its forward end for connection with the output terminal of a distribution source, said unit having a cylindrical portion at its rearward end, said cylindrical portion having a groove and a shoulder at each end of the groove, said groove being positioned intermediate the ends of said portion; a cylindrical retaining clip snugly fitted around said portion between said groove shoulders and snugly in said groove so that said clip will abut said groove shoulders and will not slide off of said portion, said clip having leaf spring tines extending radially outwardly and forwardly of said unit, said unit having an external shoulder extending outwardly from and radially from said portion, said external shoulder being spaced a predetermined distance forwardly of the forward ends of said tines; and a locking shield having a bore, and first and second counterbores on each side of said bore, said first counterbore being deep enough to receive substantially the entire length of said unit forward of said portion, said first and second counterbores terminating in first and second shoulders spaced apart somewhat less than said predetermined distance, said bore having a diameter such that said locking shield is slidable on and positioned on said portion and such that said bore lies between and is locked between said unit shoulder and the ends of said tines with said first shoulder approximately abutting said unit shoulder and said tines approximately abutting said second shoulder.

4,163,595
ELECTRICAL SUPPLY DEVICE
Bernard Vasseur, Lamotte-Beuvron, France, assignor to LITA, Lamotte-Beuvron, France
Filed Nov. 15, 1977, Ser. No. 851,803
Claims priority, application France, Nov. 19, 1976, 76 34918
Int. Cl.[2] H01R 13/54, 13/64
U.S. Cl. 339—88 R 7 Claims

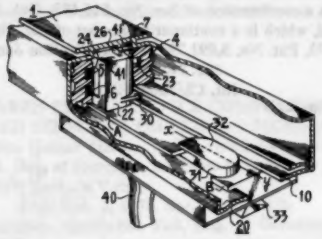
1. An electrical supply device for connecting electricity to a user apparatus comprising:

a plurality of insulated conductor wires partially embedded in an insulating sheath;

a rail having a metallic channel for receiving said wires at the periphery thereof, said channel having asymmetrical slideways situated in two different and parallel planes;

a sliding adapter having a flat part with guide means adapted to slidably engage said slideways for movement along said rail and along a longitudinal axis, means for locking said adapter to said rail in a selected position and a head part mounting a plurality of contacts and dimensioned for movement into said channel in a first orientation and thereafter, upon a pivot of 90° in a given direction about

an axis perpendicular to said longitudinal axis, bringing said contacts and wires into electrical connection, said guide means being formed by a groove extending along



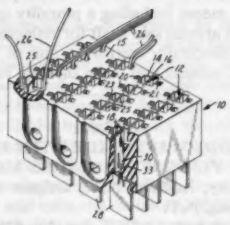
said flat part for a length substantially equal to the length of said flat part and a guide formed at the region of the junction between said head and flat parts, said groove and guide engaging respective ones of said slideways.

4,163,596

ELECTRICAL CONNECTOR

James E. Aysta, Stillwater, and Dewain R. Goff, St. Paul Park, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jan. 27, 1978, Ser. No. 872,825
Int. Cl.[2] H01R *9/08*
U.S. Cl. 339—97 P **7 Claims**



1. A connector for insulated electrical wire comprising:

a body of insulating material having a wire connection well formed into one surface to receive a slotted, flat plate, electrical contact element and to closely support the outside edges of the legs of the contact element, a wire retention well formed into said one surface adjacent said wire connection well for receipt of an insulated wire to be connected, and a passageway joining said wire retention well to said wire connection well, said passageway extending into said one surface of said body and being aligned with the position of the slot in a contact element supported in said wire connection well, said passageway being constricted to engage the insulation of a said wire to be connected by a contact element in said wire connection well; said wire connection well, said passageway and said wire retention well together defining a wire path from said wire connection well through said passageway into said wire retention well, then turning and exiting from said wire retention well through said one surface of said body, and

a slotted, flat plate, electrical contact element in said wire connection well of said body with the open end of its slot adjacent said one surface of said body to receive and strip insulation from an insulated wire forced into said wire connection well,

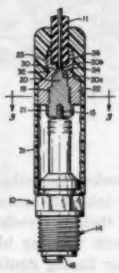
whereby an insulated wire may be forced into said wire connection well and simultaneously into said passageway and said wire retention well, said contact element stripping insulation from the wire to make electrical contact to the wire while the passageway walls engage the wire insulation and the wire is bent in passing from said passageway and out of said wire retention well to provide strain relief for the connected wire.

4,163,597

ELECTRICAL CONNECTOR FOR A SPARK PLUG

Alfred R. Brenholts, Houston, Tex., assignor to Stitt Spark Plug Company, Conroe, Tex.

Filed Aug. 14, 1978, Ser. No. 933,437
Int. Cl.[2] H01R *13/38*
U.S. Cl. 339—100 **4 Claims**



1. A two-piece electrical connector for detachably, electrically connecting a lead wire with the terminal of a spark plug, comprising:

(a) an electrically conductive male member having:

(i) a multiangular base portion formed with an axially disposed socket to receive the terminal of a spark plug,

(ii) an externally threaded intermediate portion, and

(iii) a pointed outer tip portion; and

(b) an electrically conductive female member having:

(iv) an opening at one end thereof to receive a bared end of a lead wire,

(v) an internal chamber communicating with the lead wire-receiving opening and terminating at one end thereof in an annular, beveled seat disposed in adjacent, surrounding relation to said lead wire-receiving opening,

(vi) an intermediate, internally threaded socket adjoining said chamber, and

(vii) an annular, deformable skirt formed on the end of said female member opposite the lead wire-receiving opening thereof;

said male and female members being detachably connectable by threaded engagement of their threaded intermediate portions, the tip portion of said male member being arranged to clamp the bared end of said lead wire against the beveled seat of said female member upon full threaded engagement of said male and female members, and the skirt of said female member being deformable about the multiangular base portion of said male member to hold said male and female members against accidental detachment.

4,163,598

POINT-TO-POINT MINIATURE COAX CONNECTOR

Edward A. Bianchi, and John H. Huber, both of Harrisburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

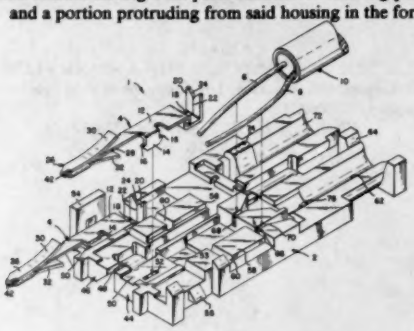
Filed May 17, 1978, Ser. No. 906,534
Int. Cl.[2] H01R *13/58*
U.S. Cl. 339—107 **2 Claims**

1. In a container for attachment to a coaxial cable having a pair of electrical contacts secured respectively to a center conductor and a ground conductor of the cable and adapted

for pluggable conection into a matrix of substrate apertures lined with conductive material, the improvement comprising:

a dielectric housing formed in two sections hinged together for enclosure on said cable,

each contact having a slit plate conductor receiving portion and a portion protruding from said housing in the form of



a central blade flanked on either side by spring blade portions integrally joined to said center blade and flaring outwardly toward their free ends away from said center blade, whereby both flanking blades are progressively flattened from their flaring configurations flatly against said center blade upon pluggable connection of said contact protruding portions into said substrate apertures.

4,163,599

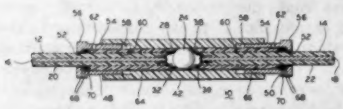
DETACHABLE HIGH VOLTAGE CONNECTION

Jay S. Plugge, Waukesha, and Eugene S. Hammer, Greendale, both of Wis., assignors to General Electric Company, Milwaukee, Wis.

Filed Mar. 6, 1978, Ser. No. 883,868

Int. Cl.[2] H01R *7/06*

U.S. Cl. 339—115 C **10 Claims**



1. A high voltage electrical cable connection for interconnecting a pair of electrical cables, each having an outer insulation layer and a central stranded conductor terminating in a cable end; said connection comprising:

a. first and second generally funnel shaped conductors in conductive contact enclosing the stranded conductor and extending from each of said cable ends;

b. a spherical conductor interposed between said funnel shaped conductors; and

c. means for housing and insulating said cable ends, said funnel shaped conductors, and said spherical conductor in compressive engagement within a dielectric medium to provide electrical contact through the cables.

4,163,600

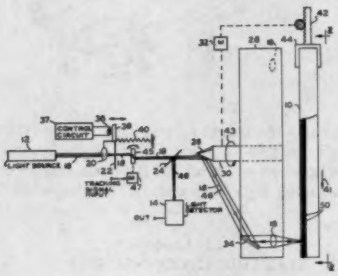
LIGHT BEAM SCANNER

James T. Russell, Richland, Wash., assignor to Eli S. Jacobs, New York, N.Y.

Division of Ser. No. 727,369, Sep. 27, 1976, Pat. No. 4,090,031, which is a continuation of Ser. No. 516,453, Oct. 21, 1974, abandoned, which is a continuation-in-part of Ser. No. 375,336, Jul. 2, 1973, Pat. No. 3,891,794. This application Jan. 19, 1978, Ser. No. 870,642

Int. Cl.[2] G02B *27/17*

U.S. Cl. 350—6.7 **6 Claims**



1. A light beam scanner apparatus comprising:

a rotating scanner wheel supported on a rotor shaft;

a plurality of lenses and associated first mirrors mounted in lens-mirror pairs on said scanner wheel; and

distributor means mounted on the rotor shaft for distributing a light beam to one of the lens-mirror pairs at a time, said distributor means including a plurality of distributor mirrors spaced around said shaft for reflecting the light beam from one distributor mirror to one of the first mirrors which first reflects said beam through its associated lens.

4,163,601

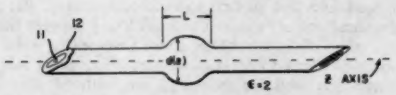
MULTIMODE WAVEGUIDE WITH ENHANCED COUPLING WITH GUIDED MODES

Robert Olshansky, Addison, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Aug. 12, 1977, Ser. No. 824,154

Int. Cl.[2] G02B *5/14*

U.S. Cl. 350—96.31 **8 Claims**



1. An optical waveguide in which light travels along said waveguide in guided and unguided modes of propagation each having a propagation constant β, the difference between the propagation constants for the highest order guided mode to be coupled and the next higher order mode being the critical frequency ω_c, said waveguide comprising:

a glass core,

a glass cladding around said core, said core having a higher index of refraction than said cladding, and

perturbations spaced along the length of said core, each perturbation having a departure from the unperturbed waveguide which joints smoothly to the unperturbed waveguide at the ends of the perturbation, each perturbation being approximately symmetric and changing monotonically from the ends of the perturbation to a point of maximum or minimum deviation, the change being smooth with only one inflection point on either side of the middle of the perturbation, each perturbation having a power spectrum which decreases with increasing mode

order and which has a plurality of minima, the length of each perturbation being such that the first minima in the power spectrum of the perturbation occurs at the critical frequency ω_c and the power spectrum at frequencies greater than ω_c has an amplitude greater than zero and at least two orders of magnitude below the peak amplitude of said power spectrum.

4,163,602

INFRARED PICK-UP DEVICE COMPRISING AN INFRARED SENSITIVE TELEVISION PICK-UP TUBE

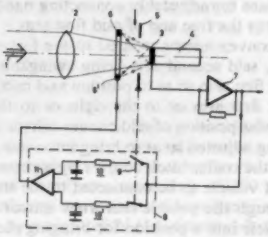
Klaus Schütz; Holger Helber, and Gerhard Lange, all of Bremen, Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 2, 1978, Ser. No. 874,526

Claims priority, application Fed. Rep. of Germany, Feb. 5, 1977, 2704847

Int. Cl.² H04N 5/33

U.S. Cl. 358—113 **3 Claims**



1. Infrared pick-up device comprising an infraredsensitive television pick-up tube and, arranged in the beam path for the pick-tube, a diaphragm which is alternately in the open and closed state, the amplitude of the available video signal being proportional to the speed at which the temperature changes, an infra-red radiator in the beam path for superimposing a uniform level of infrared radiation on the scene radiation, signal processing means connected to the output of the pick-up tube and the infra-red radiator for controlling the quantity of radiation produced by said infra-red radiator so that the quantity of the average scene radiation plus the superimposed additional radiation is substantially equal to the radiation coming from the diaphragm in the closed state and acting on the target plate of the pick-up tube.

4,163,603

WIDE-ANGLE PHOTOGRAHIC OBJECTIVE

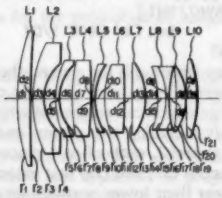
Teruyoshi Tsunashima, Kawasaki, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Aug. 19, 1977, Ser. No. 826,144

Claims priority, application Japan, Aug. 20, 1976, 51-98765

Int. Cl.² G02B 9/64

U.S. Cl. 350—214 **4 Claims**



1. A wide-angle photographic objective comprising, in the order from the object side:

a first component which is a positive meniscus lens having its convex surface facing the object side;

a second component which is a negative meniscus lens having its convex surface facing the object side;

a third component which is a negative meniscus lens having its convex surface facing the object side;

a fourth component which is a positive lens;

a fifth component which is a negative meniscus lens having its convex surface facing the object side;

a sixth component which is a positive lens;

a seventh component which is a positive lens;

an eighth component which is a biconcave negative lens comprising a doublet;

a ninth component which is a positive meniscus lens having its convex surface facing the image side; and

a tenth component which is a positive lens;

the photographic objective satisfying the following conditions:

$$\begin{aligned}
6.1f < f_1 &< 8.0f \\
-1.4f < f_2 &< -1.1f \\
-2.1f < f_3 &< -1.7f \\
2.9f < f_4 &< 4.0f \\
-5.0f < f_5 &< -2.4f \\
1.3f < f_6 &< 1.7f \\
1.6f < f_7 &< 1.8f \\
-1.0f < f_8 &< -0.8f \\
1.3f < f_9 &< 1.6f \\
2.0f < f_{10} &< 2.3f
\end{aligned}$$

$$1.3 < \frac{r_2 + r_1}{r_2 - r_1} < 1.8$$

$$-2.2 < \frac{r_4 + r_3}{r_4 - r_3} < -1.8$$

$$-3.2 < \frac{r_6 + r_5}{r_6 - r_5} < -2.8$$

$$4.5 < \frac{r_{11} + r_{10}}{r_{11} - r_{10}} < 9.5$$

where f represents the total focal length of the entire system, and f_1, f_2, f_3, . . . f_{10} represent the focal lengths of said first, second, third, . . . and tenth components, respectively; and where r_1, r_2, r_3, r_4, r_5, r_6 represent the curvature radii of the surfaces of said first, second and third conponents, respectively, which face the object side and the image side, respectively, r_{10} represents the curvature radius of the surface of the fifth component which faces the image side, and r_{11} represents the curvature radius of the surface of the sixth component which faces the object side.

4,163,604

PROJECTION LENS

Ellis I. Betensky, Willowdale, Canada, assignor to U.S. Precision Lens, Inc., Cincinnati, Ohio

Filed Dec. 23, 1977, Ser. No. 864,018

Int. Cl.² G02B 9/14

U.S. Cl. 350—226 **10 Claims**

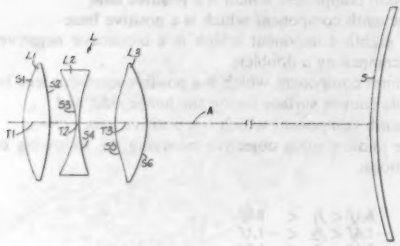
1. A lens comprising three elements, a first biconvex element, a second biconcave element, and a third biconvex element, and further defined by the following relationship

$$1.6 < \tfrac{1}{2}(k1 + k3) < 1.8$$

$$3.0 < |k2| < 3.2$$

$$0.22 < F_N(T1 + T3) < 0.26$$

where k1, k2 and k3 are the powers of the first, second and third elements, respectively; T1 and T3 are the axial thick-



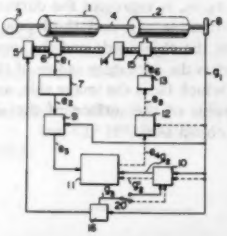
nesses of the first and third elements as a fraction of the equivalent focal length, and F_N is the F-number of the lens.

4,163,605

METHOD OF PICTURE REPRODUCTION WITH VARIABLE REPRODUCTION SCALE

Mitsuhiko Yamada, Ogurusukita-danchi #30-206, 6 Goto-cho, Ogurusu-minami, Fushimi-ku, Kyoto-shi, Japan

Filed Jul. 13, 1977, Ser. No. 815,174
Claims priority, application Japan, Jul. 20, 1976, 51/86256
Int. Cl.² H04N *1/06*
U.S. Cl. 358—287 **8 Claims**



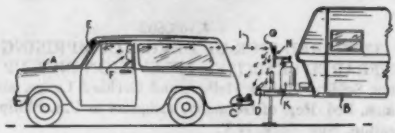
1. In a picture reproducing method comprising scanning an original picture to obtain picture signals to be recorded, correcting impurities of color ink components, generating timing pulses in synchronism to a scanning speed, writing the picture signals into a memory including addressing said memory in synchronization with the timing pulses, reading out the picture signals from the memory including addressing said memory in synchronization with the timing pulses, and recording the reproduction picture from the picture signals read out from the memory; a method of varying reproduction scale, wherein either one of said steps of writing in or reading out memory address signals includes the step of addressing said memory with additional address signals synchronized to other pulses different from the timing pulses, said other pulses being inserted among the timing pulses without changing a base frequency of said timing pulses.

4,163,606

HITCH VIEWING TRAILER MIRROR WITH SNAP BUTTON CONNECTION

Peter M. Granno, Rte. 1, Box 401, Molalla, Oreg. 97038

Filed Jun. 9, 1978, Ser. No. 914,044
Int. Cl.² G02B *5/10*
U.S. Cl. 350—307 **2 Claims**



1. A hitch viewing trailer mirror support comprising:
(a) a horizontal extensible first arm;
(b) means for supporting one end of said arm to the front of a trailer and to the rear of the trailer hitch coupler;
(c) a mirror supporting extensible second arm;
(d) means for adjustably connecting one end of said second arm to the free end of said first arm;
(e) a convex mirror secured to the free end of said second arm, said second arm being swingable about the axis of said first arm so as to position said mirror above or below said first arm or to the right or to the left thereof, the angular position of said convex mirror on said second arm being adjusted so as to bring into view the area surrounding the trailer hitch coupler by a person sitting in a powered vehicle to be connected to the trailer when looking through the vehicle rear view mirror while backing the vehicle into a position for bringing the vehicle hitch ball into registration with the trailer hitch coupler;
(f) said horizontal extensible first arm including a cylindrical member having spaced apart sets of openings, the opening in each set being angularly spaced from each other 90° apart;
(g) said first arm also including a rod slidable in said cylindrical member and having a snap button receivable in any one of said openings;
(h) said means for adjustably connecting said second arm to said first arm comprising a T-shaped coupling connected to the outer end of said first arm and swingable about said arm into different angular positions;
(i) said second extensible arm including a tubular member adjustably receivable in said coupling and having spaced apart sets of openings, the openings in each set being angularly spaced from each other 90° apart; and
(j) said second arm also including a mirror supporting standard slidably received in the tubular member of said arm and having a snap button receivable in any one of said openings in the second tubular member.

4,163,607

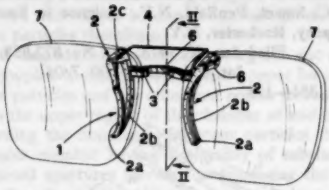
AUXILIARY LENSES UNIT FOR GLASSES

Giorgio Nannini, Via Grandi, 153, Modena, Italy

Filed Apr. 12, 1977, Ser. No. 786,845
Claims priority, application Italy, Apr. 30, 1976, 4800/76[U]; Jul. 23, 1976, 28967/76[U]
Int. Cl.² G02C *9/04*
U.S. Cl. 351—47 **9 Claims**

1. An auxiliary lenses unit for glasses, the unit consisting of a supporting central body and of a pair of auxiliary lenses linked by a bridge which can rotate and which is supported by said central body including two pincers each made at least in part of elastic material, each of said pincers being provided with two extensions (*2a*) and (*2b*) that extend downwards and almost touch near their lower portions; an operating member (4) which forms part of said central body integral with one of the two extensions of each of said pincers and fit for supplying, through a manual push, a bending moment such as to move the two extensions of each of said pincers from one another, said

bridge having two pins (6a) at its ends which fit in said central body, said pins having a polygonal section and being fitted in



corresponding seats in said central body having the same polygonal section.

4,163,608

HYDRATABLE GAS PERMEABLE METHYL METHACRYLATE COPOLYMER

Charles W. Neefe, P.O. Box 429, Big Spring, Tex. 79720

Filed Oct. 5, 1977, Ser. No. 839,750
Int. Cl.[2] C08F 20/06; G02C 7/04
U.S. Cl. 351—160 H **3 Claims**

1. A contact lens concave-convex form in section and of a curvature substantially the same as the eye to which it is applied, made of a hydrated oxygen permeable copolymer, providing an oxygen equivalent of 6.71% at a lens thickness of 0.15 millimeters said copolymer consisting of 100 parts by weight methyl methacrylate monomer copolymerized with from 1 to 50 parts by weight of N-(1,1-dimethyl-3-oxobutyl) acrylamide monomer and 2 to 30 parts by weight methacrylic acid.

4,163,609

SELF CLEANING CONTACT LENS

Charles W. Neefe, 811 Swing St., Big Spring, Tex. 79720

Filed Oct. 10, 1978, Ser. No. 950,211
Int. Cl.[2] G02C 7/04
U.S. Cl. 351—160 H **5 Claims**

1. A contact lens of concave-convex form in section, composed of a polymeric material having a negative electrical charge present on a hydrophilic surface and the lens surface having an affinity for water, whereby the lens material, while in the eye remains wetted by the liquid tears present on the surface of the eye and the hydrophilic surface of the lens material resists the accumulation of and repels from the lens surface the natural hydrophobic oil and protein particles present in the natural tear fluid present on the surface of the eye.

4,163,610

REAR/REMOTE-SCREEN PROJECTOR

William R. Sanderson, Rochester, N.Y., assignor to The Singer Company, New York, N.Y.

Filed Nov. 16, 1978, Ser. No. 961,304
Int. Cl.[2] G03B 21/22
U.S. Cl. 353—71 **6 Claims**

1. An apparatus for the projection of images contained on slides comprising;

a housing;

means within said housing for handling said slides;

means within said housing for projecting light through said slides along an optical path;

a projection screen mounted in one face of said housing;

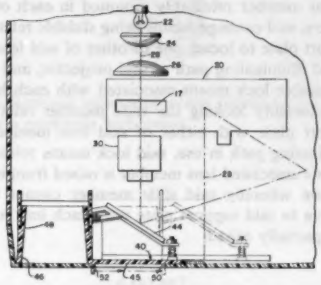
at least one mirror located within said housing for folding said optical path of said apparatus for projecting said slide images on said projection screen;

a laterally shiftable frame mounted within said housing;

one of said mirrors mounted on said shiftable frame;

means for moving said frame between a first position in which said one mirror is in registry with said optical path and a second position in which said one mirror is completely removed from said optical path;

said frame extending beyond said one mirror and being formed with an aperture therethrough in a plane intersection said optical path, said aperture being located in said frame such that when said frame is in said second position said aperture is coaxial with said optical path;



stop means in cooperation with said frame for establish said first and said second positions thereof; and

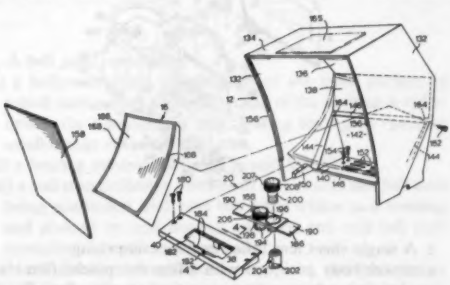
said housing being formed with an aperture therethrough located adjacent said frame such that when said frame is in said second position said housing aperture is coaxial with said optical path, whereby said slide images may be projected onto a remote screen.

4,163,611

MICROFICHE READER

Peter J. Hall, Barrie, Canada, assignor to MicroVue Products Inc., Barrie, Canada

Division of Ser. No. 777,772, Mar. 15, 1977, Pat. No. 4,140,376.
This application Sep. 23, 1977, Ser. No. 836,211
Claims priority, application Canada, Dec. 16, 1976, 268032
Int. Cl.[2] G03B 23/08, 21/14
U.S. Cl. 353—101 **3 Claims**



1. In a microfiche reader of the type having a housing, an image projection system including projector means and a screen for receiving a projected image and an illuminating path extending from the projector means to the screen, a microfiche carriage having an upper glass flat arranged to be disposed above a microfiche in the carriage, the improvement of, a lens assembly comprising,

(a) a support plate mounted a substantial distance above said microfiche carriage,

(b) passage means opening through said support plate in alignment with the illuminating path of said projector,

(c) a slide member mounted in said support plate for sliding movement relative thereto in a first direction, said slide member having first and second tubular sleeves projecting downwardly therefrom and spaced in said first direction,

said tubular sleeves each having a sufficient length to extend to adjacent said upper glass flat,

(d) a pair of longitudinally elongated lens passages extending one through each of said tubular sleeves

(e) a longitudinally elongated lens holder mounted in a close fitting sliding relationship within each of said lens passages, each lens holder being guided by its associated lens passage for movement between a raised position and a lowered position relative to said upper glass flat,

(f) a lens member releasably mounted in each of said lens holders, said carriage means being slidable relative to said support plate to locate one or other of said lens members in said illuminating path of said projector, and

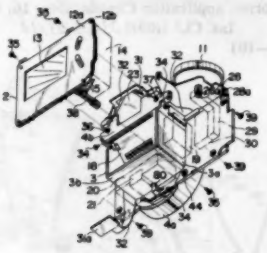
(g) releasable lock means associated with each lens holder for releasably locking the slide member relative to the support plate with either of said lens members in said illuminating path in use, said lock means releasable only after its associated lens member is raised from its lowered position whereby said slide member cannot be moved relative to said support plate until each lens holder is at least partially raised.

4,163,612

CAMERA STRUCTURE FOR SINGLE LENS REFLEX CAMERA

Hiroshi Ueda, Nara; Takayoshi Miyamoto, and Masatake Niwa, both of Sakai, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Dec. 21, 1977, Ser. No. 862,967
Claims priority, application Japan, Dec. 27, 1976, 51-160372
Int. Cl.[2] G03B *19/12, 17/02*
U.S. Cl. 354—152 **13 Claims**



1. A single sheet lens reflex camera comprising:

a camera body provided with a film receptacle, film transporting mechanism and operating member for effecting film advancing and shutter cocking;

a shutter block in which a shutter mechanism and a shutter actuating and controlling mechanism are mounted as a unit on a base plate; and

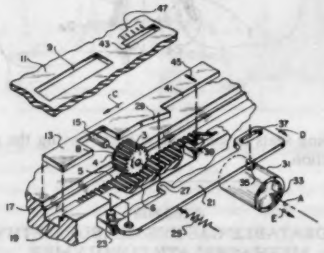
a front plate formed with a mounting for the camera objective lens and having attached thereto a mirror box which is provided with a reflex mirror, mirror driving mechanism and diaphragm driving mechanism, the front plate and elements attached thereto being coupled with the shutter block to form a sub-assembly in which said shutter actuating and control mechanism, said mirror driving mechanism and said diaphragm driving mechanism are interconnected as operable units thereby enabling independent adjustment thereof, said sub-assembly being attached to the camera body.

4,163,613

CAMERA FOCUS OR EXPOSURE ADJUSTMENT MECHANISM

David C. Smart, Penfield, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 27, 1978, Ser. No. 872,858
Int. Cl.[2] G03B *3/00, 7/04*
U.S. Cl. 354—198 **7 Claims**



1. In a photographic camera of the type including a control element movable for adjusting a function in the camera; a rotatable wheel member adapted to cooperate with a fixed longitudinal member for causing said wheel member to translate along said fixed member as said wheel member is rotated in contact with said fixed member; and means coupling said control element and said wheel member for adjustably moving said control element in response to translation of said wheel member along said fixed member, the improvement comprising:

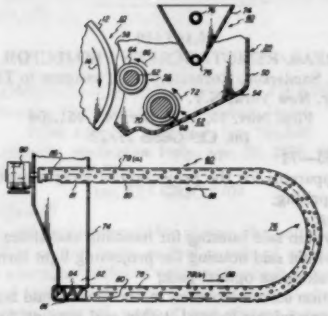
a camera body housing said wheel member and said fixed member, said camera body including exterior wall means defining a slot through which only a portion of said wheel member extends from said camera body for enabling said wheel member to be manually rotated for translation along said fixed member to adjustably move said control element.

4,163,614

CLOSED LOOP PARTICLE DISPENSER

Richard C. Vock, Ontario, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 12, 1977, Ser. No. 859,414
Int. Cl.[2] G03G *15/00*
U.S. Cl. 355—3 DD **1 Claim**



1. An electrophotographic printing machine of the type having an electrostatic latent image recorded on a photoconductive member, wherein the improvement includes:

means for housing a supply of developer material comprising carrier granules and toner particles;

means for depositing toner particles onto the latent image forming a powder image on the photoconductive member;

a hopper defining a chamber having a supply of toner particles therein, said hopper having an aperture for discharging toner particles therefrom;

a flexible, U-shaped tubular member having one end region thereof coupled to the aperture in said hopper for receiving toner particles and the other end region thereof positioned in the upper region of the chamber of said hopper for returning the non-dispensed toner particles thereto, said tubular member having a plurality of substantially equal spaced apertures therein for dispensing the toner particles therefrom into said housing, said tubular member having a slot in the end region thereof coupled to the aperture in said hopper for receiving the toner particles therefrom with the other end region thereof having a plurality of apertures therein for returning non-dispensed toner particles to the chamber of said hopper;

an elongated, flexible helical member disposed interiorly of said tubular member and extending the length thereof; and

means for rotating said helical member to advance the toner particles through said tubular member.

4,163,615

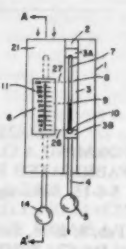
READER FOR HEMATOCRIT VALUE

Alan Kwasman, 6239 Morse Ave., North Hollywood, Calif. 91606

Filed Oct. 25, 1977, Ser. No. 844,964

Int. Cl.[2] G01N *33/16*; G01B *11/00*

U.S. Cl. 356—39 **4 Claims**



1. A device for determining the sedimented red cell percentage of a blood sample centrifuged in a capillary tube comprising an adjustable holding means for said capillary tube and means for producing a variable sized image of a percentage scale in close proximity to said capillary tube whereby adjustment of said image to match the linear size of said blood sample permits direct reading of sedimented red blood percentage.

4,163,616

TOP-TO-BOTTOM MIXER

C. Kenneth Claunch, Erie, Pa., assignor to Finish Engineering Company, Inc., Erie, Pa.

Filed Mar. 23, 1978, Ser. No. 889,371

Int. Cl.[2] B01F *5/12*

U.S. Cl. 366—262 **14 Claims**

1. A top-to-bottom mixer comprising,

a body,

a hollow tube attached to said body and adapted to extend downward through a relatively small hole in a container of liquid,

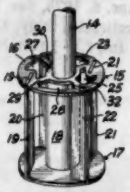
said body comprising,

motor means having a shaft,

said shaft is connected to said motor means and extending through said hollow tube concentric thereto,

circulation means in said tube fixed to the said concentric shaft causing a downflow through said tube,

discharge openings in the wall of said tube adjacent the lower end thereof for discharging liquid from said circulation means causing a high flow of fluid across the bottom



of said container when said motor rotates said concentric shaft at a relatively high speed.

4,163,617

BALL JOINT

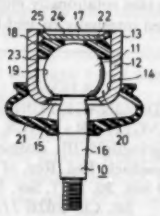
Akira Nemoto, Toyohashi, Japan, assignor to Musashisemitsukoguo Kabushikikaisha, Japan

Filed Feb. 6, 1978, Ser. No. 875,485

Claims priority, application Japan, Feb. 14, 1977, 52-14773; Feb. 14, 1977, 52-14774

Int. Cl.[2] F16C *11/00*; F16D *1/12*

U.S. Cl. 403—132 **9 Claims**



1. A ball joint comprising:

(i) a hollow housing at least part of the inner surface of which terminating at one open end of the housing is cylindrical, the other end of said housing having an aperture smaller than said one open end,

(ii) a bearing member disposed in said housing,

(iii) a ball stud including a ball head on a shank, said ball stud being positioned with said ball head within said housing and abutted by said bearing member, and said ball stud extending through said aperture,

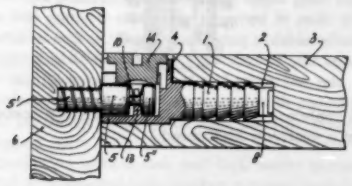
(iv) a resiliently deformable closing plate, said plate being circular and including a circumferential peripheral portion which is inclined with respect to the median plane of the plate such that the plate has concavity at one major face and convexity at the other major face, the greatest diameter of said peripheral portion in the unconstrained state being greater than the internal diameter of said cylindrical inner surface of the housing, said closing plate being press-fitted with resilient deformation into the open end of the housing with its concavity presented towards the bearing member for the application of pressure between the bearing member and the ball head, the peripheral portion engaging at its greatest diameter with the cylindrical inner surface, as a result of the stress generated by resilient deformation of the plate, to secure the plate against return movement with respect to the housing towards said open end.

4,163,618

JOINT FOR FURNITURE

Fiorello Giovannetti, via Marsiano 4, Milan, Italy

Filed Apr. 6, 1978, Ser. No. 893,983
Claims priority, application Italy, May 19, 1977, 23782 A/77
Int. Cl.[2] F16B *21/02*
U.S. Cl. 403—245 9 Claims



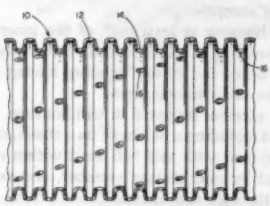
1. A joint for furniture, comprising a shank and head for fastening in an opening formed in a first panel, said head removably engaging with a pin projecting from a second panel to interconnect the first and second panels, said pin having a shaped head, wherein the joint head defines a seat coaxial with said shank, which seat is open at the front and top for the introduction of said pin from above; said seat in the joint head having longitudinal slots formed internally and a transverse rib extending from an intermediate portion of the bottom of said seat engageable with the shaped end of the pin; a clamping cover operatively associated with said seat for clamping the pin and for closing at top of said seat, said clamping cover having projecting tabs rotationally engageable in said longitudinal slots provided internally of said head.

4,163,619

CORRUGATED DRAINAGE TUBING WITH HELICALLY ARRANGED DRAINAGE OPENINGS

David E. Fales, Springfield, Ill., assignor to Rainer Isolierrohrfabrik Max Drossbach, Fed. Rep. of Germany

Filed Sep. 30, 1977, Ser. No. 838,367
Int. Cl.[2] E02B *11/00*
U.S. Cl. 405—49 7 Claims



1. Corrugated drainage tubing of organic thermoplastic material comprising a tubular wall of alternating peaks and valleys and a plurality of drainage openings in the valleys, characterized in that a like plurality of spaced drainage openings are provided about the circumference of each valley in the base thereof, the drainage openings in each valley are axially and circumferentially offset of wall material from the nearest adjacent drainage opening in adjacent valleys and, together with the nearest adjacent drainage openings in successive adjacent valleys, form a plurality of arrays of drainage openings extending along parallel helical lines at an acute angle in the range of about 14°–37° to the longitudinal tubing axis, and each said drainage opening is axially spaced by wall material from each adjacent helical array and the drainage openings of each said adjacent helical array for an axial distance comprising a plurality of valleys.

4,163,620

METHOD AND APPARATUS FOR INCREASING THE VERTICAL LOAD BEARING CAPACITY OF ICE

Gunter J. Lichtenberger, Dallas, Tex., assignor to Sun Oil Company, Ltd., Calgary, Canada

Filed Feb. 27, 1978, Ser. No. 881,441
Int. Cl.[2] F25D *1/00*
U.S. Cl. 405—217 6 Claims

1. A method for increasing the load bearing capacity of a natural ice sheet comprising the steps of:

(A) introducing an inflatable member beneath the ice sheet in the predetermined area;

(B) inflating the inflatable member;

(C) monitoring the inclination of the ice sheet in the predetermined area; and

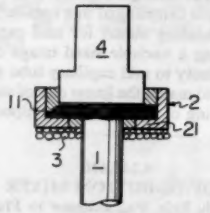
(D) terminating the inflation step when the inclination reaches a predetermined angle.

4,163,621

METHOD FOR FORMING A CONTINUOUS FOOTING WITH PREFABRICATED FOOTING BLOCKS

Tadayasu Higuchi, 5-6-15, Sakuragaoka, Setagaya-ku, Tokyo, Japan

Filed Feb. 8, 1978, Ser. No. 875,975
Int. Cl.[2] E02D *5/50*
U.S. Cl. 405—255 10 Claims

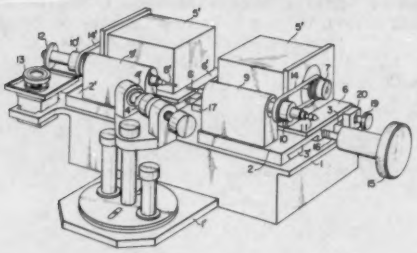


1. A method for forming a continuous footing for constructing a building on a concrete pile foundation comprising: placing a leveling element comprising a base plate having an aperture for receiving the top of a concrete pile and side walls having indentations at each pile so that said aperture receives each of the tops of the concrete piles remaining above the ground level after they have been driven into the soil, breaking the tops of the concrete piles so as to expose the reinforcing bars of the piles, bending down the exposed reinforcing bars onto the surface of the base plate, fixing the pile and the leveling element by filling mortar, placing pre-fabricated footing blocks so that at least a part thereof is received in one of the indentations, thus forming a continuous footing, and fixing the footing blocks.

4,163,622
DRILLING MACHINE

Hayao Akaba, Akishima, and Takuzo Takeuchi, Fussa, both of Japan, assignors to Hoya Lens Corporation, Tokyo, Japan

Filed Oct. 27, 1977, Ser. No. 846,039
Claims priority, application Japan, Oct. 29, 1976, 51/130290
Int. Cl.[2] B23B *39/22, 41/00*
U.S. Cl. 408—27 5 Claims

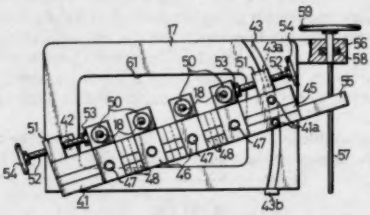


1. A lens drilling machine comprising, in combination, a base for supporting first and second lens holding means, a table means for each of a pair of drilling means, the table means supporting the drilling means and being slidable on the base; each drilling means having a shaft gripping at one end thereof a drill in axial opposing alignment with the other drill and shaft and means for turning each drill in the same direction at a synchronized speed; the table means including means for permitting the drills to axially approach to or axially separate from each other symmetrically with respect to a lens fixedly supported by the first holding means in order to drill a hole completely through the lens from both sides of the lens simultaneously, at least one shaft having at an end opposite to the drill end a diamond cutter means for cutting a groove in the lens for fixing hooks to the lens and the second lens holding means being located immediately adjacent to the cutter means.

4,163,623
MULTIPLE SPINDLE DRILLING MACHINE FOR WIDE FLANGE BEAMS

Toshikatsu Kitagawa, Seki, Japan, assignor to Miyakawa Industry Company, Limited, Seki, Japan

Filed Nov. 16, 1977, Ser. No. 852,005
Int. Cl.[2] B23B *39/20*
U.S. Cl. 408—46 9 Claims

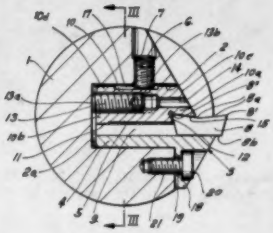


1. A multiple spindle drilling machine comprising drilling means attached to a movable attachment stand to drill a web of a wide flange beam, said drilling means including a plurality of drills aligned in the lateral direction of the web, spindles for supporting the respective drills and spindle holding members for supporting the respective spindles, gripping means disposed to grip all the spindle holding members from both the outer sides and fix them onto the movable attachment stand so that they cannot be moved, and shifting means for swinging and shifting the movable attachment stand from the point on a line intersecting rectangularly a flange of the wide flange beam to the point on a line intersecting obliquely the flange of the wide flange beam with one end of the movable attachment stand being the center.

4,163,624
TOOLHOLDER FOR RECESSING OPERATIONS, IN PARTICULAR A BORING BAR

Otto Eckle, Löchgau, Fed. Rep. of Germany, assignor to Komet Stahlhalter- und Werkzeugfabrik Robert Breuning GmbH, Besigheim, Fed. Rep. of Germany

Filed Jan. 23, 1978, Ser. No. 871,553
Claims priority, application, Fed. Rep. of Germany, Feb. 9, 1977, 7703785
Int. Cl.[2] B23B *29/02*
U.S. Cl. 408—185 10 Claims



1. In a toolholder for recessing operations, in particular a boring bar, equipped with at least one recessing tool having a cutting body of hard metal, the recessing tool being arranged in a cylindrical receiving bore in the toolholder and being held by a retaining screw arranged in the toolholder perpendicularly to the receiving bore, comprising the improvement wherein the receiving bore is formed as a blind bore, wherein in the blind bore there is arranged a tool support with a substantially semi-cylindrical shank having in its plane supporting surface facing the retaining screw at least one groove extending parallel to its axis for receiving an exchangeable cutting body slidably mounted in the groove, wherein a clamping jaw for each cutting body is provided in the other remaining half of the blind bore and, under the action of the retaining screw, is supported by its front, outer, end on the top of the cutting body and by its rear end on the supporting surface of the tool support, and wherein the clamping jaw has at its front end a shoulder supporting the cutting body in the direction of sliding and is provided with a setscrew extending parallel to the groove, the rear end of the setscrew being supported on the base of the blind bore and its front end being accessible through a bore opening out in the outer end face of the clamping jaw.

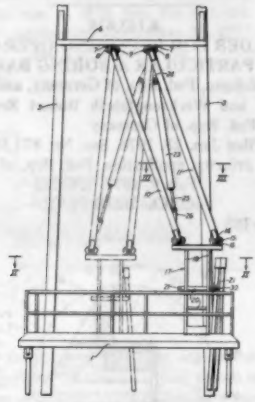
4,163,625
MOVABLE WORKING PLATFORM FOR USE IN RACKING DRILL PIPE

Cecil Jenkins, Tulsa, Okla., assignor to Lee C. Moore Corporation, Tulsa, Okla.

Filed Feb. 10, 1978, Ser. No. 876,668
Int. Cl.[2] E21B *19/14*
U.S. Cl. 414—22 6 Claims

1. Apparatus for racking pipe stands in the racking platform of an oil well drilling mast or derrick structure, comprising a support adapted to project from the side of such a structure above its racking platform, suspension means extending downwardly from said support and suspended therefrom, a carriage suspended from the lower end of said suspension means and provided with a floor to support a derrick man inside the carriage, the suspension means being flexibly connected to said support and carriage, means for selectively swinging the lower end of said suspension means back and forth in a first vertical plane and back and forth in a second vertical plane at right

angles to said first plane to thereby move the carriage in the same directions, and pipe-receiving means projecting from the



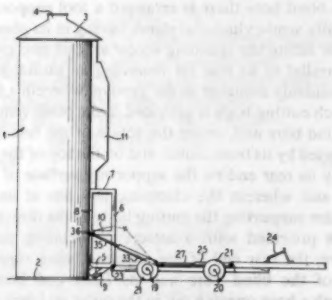
side of the carriage for engaging the side of the upper portion of a pipe and moving it with the carriage to another location.

4,163,626

ERECTION MEANS FOR A TRANSPORT TRAILER

Elmo L. Batterton, and Melvin J. Lonsdale, both of Morton, Ill., assignors to Meyer Morton Co., Morton, Ill.

Filed Jan. 3, 1978, Ser. No. 866,215
Int. Cl.[2] B60P *1/64*
U.S. Cl. 414—469 **7 Claims**



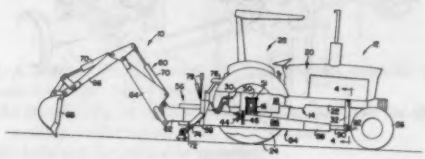
1. Erection means for a transport trailer of the type having a frame with side rails and a forwardly projecting tongue adapted to be connected to a tractor to support an elongated object of large cross section in horizontal position and deliver the object in upright position which comprises carriages slidable along the length of said side rails, a pair of forward hydraulic jacks arranged one on each side rail, a pair of rearward hydraulic jacks arranged in tandem with said forward pair to cooperate therewith in elevating and delivering the object on the trailer, said forward hydraulic jacks each having a piston rod connected to a carriage for propelling the carriages along the length of said side rails, said rearward pair of hydraulic jacks each having a cylinder pivoted to a carriage, said rearward pair of jacks each having a piston rod projecting from the free end of the cylinder, means for pivotally connecting the rear end of said trailer with said object, means for pivotally connecting the piston rods of said rearward pair of jacks to said object forwardly of and at a level above said means for pivotally connecting the object to said trailer, and means for energizing said forward and rearward pairs of jacks to propel said carriages rearwardly for increasing the angle of inclination of said rearward pair of jacks to apply a more direct lifting load to the object and for propelling the piston rods out of the cylinders of the rearward pair of jacks to swing the object about the means for pivotally connecting the rear end of the trailer with said object to deposit the object in an upright position behind the trailer.

4,163,627

MOUNTING FOR AN IMPLEMENT ON A TRACTOR

Bradley J. Schnittjer, Delhi, and Michael J. O'Neill, Davenport, both of Iowa, assignors to Deere & Company, Moline, Ill.

Filed Aug. 18, 1977, Ser. No. 825,624
Int. Cl.[2] E02F *3/72*
U.S. Cl. 414—686 **12 Claims**



1. In a tractor having a main frame, including a fore and aft body portion having a pair of fore and aft laterally spaced side frame members and a transverse rear axle housing, a source of fluid pressure having an associated reservoir, and a pair of hydraulic outlets respectively connectible to the fluid pressure source and the reservoir, the combination therewith of improved means for mounting a material handling unit on the tractor wherein said unit includes a frame, a plurality of shiftable members, hydraulic motor means for shifting said members and control valve means for controlling the flow of fluid to and from said motors, said improved mounting means comprising:

an upright, transverse U-shaped forward support member having its opposite ends connected to the opposite side frame members of the tractor main frame and including a first guide element disposed generally below and centrally of the body portion:

a pair of first latch elements respectively connected to the axle housing adjacent the opposite sides of the tractor;

a second guide element attached to the forward end of the unit frame and engageable with the first guide element;

a pair of second latch elements attached to opposite sides of the unit frame rearwardly of the second guide element and respectively engageable with the first latch elements when the first and second guide elements are engaged and the unit is disposed in a predetermined position relative to the tractor, the tractor being moveable rearwardly relative to the material handling unit when the unit is separated from the tractor so the second guide element passes under the axle housing and engages the first guide element;

means for locking the latch elements in their engaged position;

and releasable connecting means for connecting the control valve means to the tractor outlets.

4,163,628

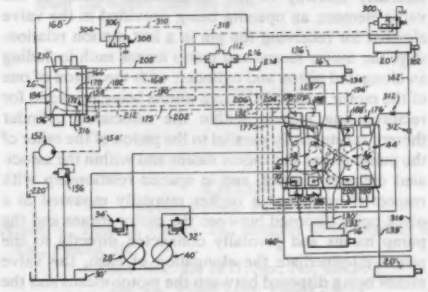
IMPLEMENT CIRCUIT FOR MOTOR WITH SLOW AND FAST DUMP

Gerald D. Hall, Joliet, and Lloyd D. Swayze, Yorkville, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed May 9, 1977, Ser. No. 795,036
Int. Cl.[2] E02F *3/87*
U.S. Cl. 414—699 **7 Claims**

1. In a vehicle having tilt cylinder means actuatable in one and the other directions to move a bucket to a dump position and to a rack-back position respectfully, a hydraulic control system comprising fluid pump means, and means operatively interconnecting the fluid pump means and tilt cylinder means (i) for selectively providing a first, relatively lower speed of

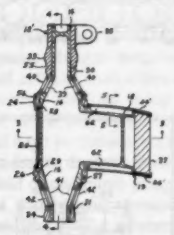
movement of the bucket from the rack-back position toward the dump position through actuation of the tilt cylinder means, and for selectively providing a second, relatively higher speed of movement of the bucket from the rack-back position toward the dump position through the actuation of the tilt cylinder means, the means operatively interconnecting the fluid pump means and tilt cylinder means including means for automatically choosing the speed of movement of the bucket such that (ii) upon initial selection of the second, relatively higher speed of movement of the bucket from the rack-back position toward the dump position, and upon a degree of said higher-speed movement taking place, the first, relatively lower speed of movement of the bucket from the rack-back position toward the dump position is automatically chosen.



4,163,629
TURBINE VANE CONSTRUCTION

Edward C. McDonough, Lawrenceburg, Ind., and Eugene N. Tuley, Hamilton, Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 23, 1977, Ser. No. 864,049
Int. Cl.[2] F01D *25/12*; F02C *7/18*
U.S. Cl. 415—115 **2 Claims**

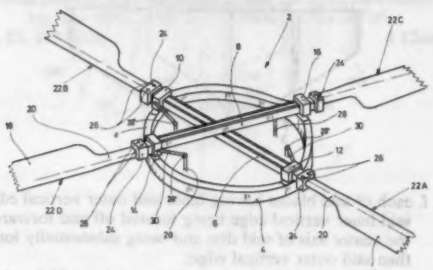


1. A turbine vane for use in high temperature gas turbines, comprising: a load carrying spar member including a vane airfoil support member; a heat shield member surrounding the vane airfoil support member; means for supporting the heat shield adjacent the vane airfoil support member; said means, for supporting the heat shield member, including means for permitting spanwise and cordwise thermal expansion of the heat shield member; means for providing an air cooling flow path through the vane airfoil support and the heat shield member; said means for supporting the heat shield member including a first boss supported on the load carrying spar member and a second boss supported on the load carrying spar member; said first boss having a projection extending along one end of the vane airfoil; said second boss having a projection extending along the other end of the vane airfoil; said means for permitting spanwise and cordwise thermal expansion of the heat shield member including slots formed between the vane airfoil support member and said first and said second bosses.

4,163,630
HELICOPTER ROTOR STRUCTURE

Emil Weiland, Hohenbrunn, Fed. Rep. of Germany, assignor to Messerschmitt-Bolkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed Aug. 12, 1977, Ser. No. 824,241
Claims priority, application Fed. Rep. of Germany, Aug. 25, 1976, 2638148
Int. Cl.[2] B64C *27/38*
U.S. Cl. 416—134 A **11 Claims**



1. A rotor structure for a rotating wing aircraft having substantially rigid rotor head means and rotor blades or wing means arranged in at least one pair, comprising blade angle bearing means (10, 12, 14, 16) for each rotor blade means, tension bar means (6,8) operatively interconnecting the rotor blade means of a pair which blade means are arranged diametrically opposite each other, said tension bar means having a high bending resistance, whereby transmission of bending moments from the rotor blades to the rotor head means is substantially prevented, each of said blade angle bearing means comprising a structure angularly movable in the wing flap direction and in the wing lead-lag direction, at least one of said blade angle bearing means of a pair comprising means permitting an axial motion of the respective tension bar means supported in said blade angle bearing means, and wherein said blade angle bearing means (10, 12, 14, 16) operatively support said tension bar means (6, 8) on said rotor head means (4) for pitch angle rotation of said tension bar means relative to said rotor head means (4), said rotor structure further comprising means (24) securing said rotor blade means (18) to said tension bar means (6, 8) in a manner rigid against rotation of the blade means about the longitudinal blade axis whereby the securing means prevent flapping, drag and lagging movements of the tension bar means, said tension bar means being constructed as torsion bars which are elastic relative to torsion about said longitudinal blade axis.

4,163,631
SURFACE AERATOR IMPELLER

John R. Connolly, Paoli; David E. Gibson, Ft. Washington; Edward L. Heimark, King of Prussia; Jerome B. Quinn, Kennett Square; Richard E. Speechley, Willow Grove, and Richard L. Winter, Berwyn, all of Pa., assignors to Philadelphia Gear Corporation, King of Prussia, Pa.

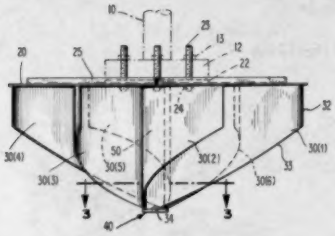
Filed Aug. 17, 1977, Ser. No. 825,486
Int. Cl.[2] B01F *3/04*
U.S. Cl. 416—185 **6 Claims**

1. A surface aerator impeller for aeration of liquids, said impeller comprising:
   a. a large flat horizontal upper disc;
   b. means adapted for securing said disc to the lower end of a vertical rotatable drive shaft for rotation therewith about the center axis of said disc;
   c. a plurality of uniformly-shaped curved vertical impeller blades the upper edges of which are secured to the under-

surface of said disc at uniformly angular spacings about the center axis of said disc;

d. each of said blades having a curved major area surface extending, as viewed vertically, in a retreating direction relative to the direction of rotation of said disc;

e. each of said blades being devoid of lateral flanges;



f. each of said blades having inner and outer vertical edges, said inner vertical edge being located off and forward of the center axis of said disc and being substantially longer than said outer vertical edge;

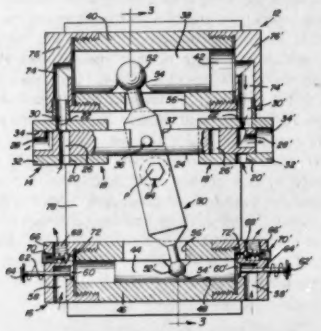
g. each of said blades having a bottom edge which extends upwardly along an inclined line toward said outer vertical edge.

4,163,632

HYDRAULIC PUMP MECHANICALLY INTERCONNECTED WITH FLUID MOTOR DISTRIBUTORS

Leslie R. Hinchman, and Robert B. Hinchman, Sr., both of San Benito, Tex., assignors to Bessie L. Caldwell, San Benito, Tex., a part interest

Filed Aug. 10, 1977, Ser. No. 823,465
Int. Cl.[2] F04B *17/00, 35/00*
U.S. Cl. 417—318 **1 Claim**



1. A hydraulic pump assembly, comprising, in combination:

(a) motor means connected to a source of fluid under pressure for being actuated by the fluid;

(b) valve means connected to the motor means for controlling operation of the motor means; and

(c) pump means connected to the motor means for actuation thereby and for increasing the pressure of a fluid passed through the pump means, the valve means inluding, in combination:

(1) a hollow housing provided with two sets of cooperating ports;

(2) a valve element slidably disposed within the housing and provided with two sets of passages selectively communicating with the associated ports for controlling fluid flow to and from the motor means; and

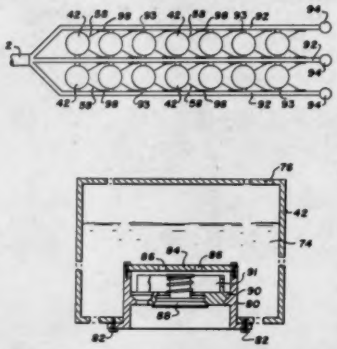
(3) coupler means attached to the valve element and to the motor means for reciprocating the valve element within the housing of the valve means, the housing being divided into two separate, spaced parts, each of the parts having a set of the ports associated therewith, and each of the parts being mounted in spaced relation with respect to one another on the motor means, the valve element extending longitudinally, and the coupling means including a pin engaging the valve element substantially midway of the longitudinal extend of the valve element, an opening being provided in the valve element for receiving the pin in a lost-motion relationship, the motor means and pump means each including an elongated piston and cylinder, with the piston of one of the motor means and pump means being arranged for reciprocating motion within the associated cylinder thereof substantially parallel to the piston of the other of the pump means and motor means and within the associated cylinder thereof, and in spaced relationship with respect thereto, and a rocker pivotally mounted at a pivot point disposed between the motor means and the pump means and pivotally connected directly to the piston intermediate the elongation of each, the valve means being disposed between the motor means and the pivot point of the rocker, and the pin being affixed to the rocker between the motor means and the pivot point of the rocker for engaging the valve element of the valve means.

4,163,633

APPARATUS FOR PRODUCING POWER FROM WATER WAVES

Joseph A. Vriend, P.O. Box 505, Squamish, British Columbia, Canada (V0N 3G0)

Filed Dec. 1, 1976, Ser. No. 746,402
Int. Cl.[2] F04B *17/00, 35/00*
U.S. Cl. 417—332 **18 Claims**



1. An apparatus for producing power from water waves comprising:

a main pipe having at least one inlet and an outlet;

a pump having an inlet to admit ambient water and an outlet communicating with the inlet of the pipe;

a first valve controlling the inlet to the pump;

a second valve controlling the outlet from the pump; and

a buoyancy vessel attached to the pump, said buoyancy vessel having a slightly positive buoyancy to follow the motion of the wave, said buoyancy vessel containing water and air in order to establish the slightly positive buoyancy and having means to control the relative amounts of water and air in order to vary the buoyancy;

an air inlet/outlet, a water inlet valve and a water outlet valve in said buoyancy vessel;

and an air line communicating with the air inlet/outlet in said buoyancy vessel whereby compressed air can be forced into the vessel to force water through the water outlet valve or air can be drawn from the vessel to permit the entry of additional water;

whereby reciprocation of the buoyancy vessel permits water to enter the pump, through the inlet, and then forces water from the outlet into the pipe.

4,163,634

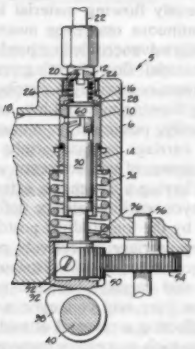
FUEL PUMP PLUNGER

Harold C. Powers, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Nov. 25, 1977, Ser. No. 854,851

Int. Cl.[2] F04B *7/04*; F02M *59/26*

U.S. Cl. 417—499 **7 Claims**



1. In an injection pump having a cylinder with a fuel inlet, an injection pump-fuel pump plunger reciprocally mounted and axially rotatable in said cylinder from a first angular position to a second angular position, and said pump plunger having a circumscribed groove of varying axial width thereabout, the groove having a scroll edge proximate one end of said plunger, said scroll edge increasing in distance from its closest point of approach to the one end of said pump plunger for less than the circumference of said plunger and remaining at substantially equal distance from said one end for substantially the rest of the circumference, so that said fuel inlet is selectively blocked by said pump plunger for a first length of reciprocal travel of said pump plunger with said pump plunger at said first angular position and blocked for a proportionally longer length of reciprocal travel of said pump plunger with said pump plunger at angular positions between said first angular position and said second angular position whereby pressure may be developed in said cylinder at said one of said pump plunger upon reciprocation thereof, said pump plunger further defining an axial slot communicating said circumscribed groove with said one end, said axial slot positioned on the periphery of said pump plunger at the point of closest approach of said scroll edge to said one end; the improvement comprising a bleed-off groove formed in said pump plunger and selectively communicating said fuel inlet with said circumscribed groove at angular positions between a position at least greater than said first angular position and a position equal to said second angular position of said pump plunger; said bleed-off groove relatively shallower than said circumscribed groove and positioned between said scroll edge and said one end.

4,163,635

VANE TYPE ROTARY FLUID PUMPS OR COMPRESSORS

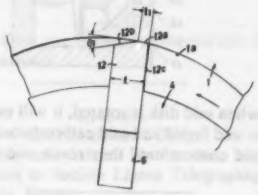
Hiroshi Sakamaki, Utsunomiya; Toshiyuki Maeda, Ageo; Toshimitsu Sakai, Okazaki, and Tadashi Saitou, Toyota, all of Japan, assignors to Nippon Piston Ring Kabushiki Kaisha, Tokyo and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Continuation of Ser. No. 663,343, Mar. 6, 1976, abandoned. This application Jun. 3, 1977, Ser. No. 803,272

Claims priority, application Japan, Jun. 24, 1975, 50-87809[U]

Int. Cl.[2] F01C *1/00, 21/00*; F04C *17/00, 29/00*

U.S. Cl. 418—236 **1 Claim**



1. In a vane type rotary fluid pump or compressor comprising a stator housing having a cylindrical inner wall, end wall structures to define a pump cavity within said stator housing, a rotor eccentrically rotatably disposed within said pump cavity, and a plurality of vanes slidably disposed in said rotor; the improvement wherein:

each of said vanes has a front and a rear face and extends outwardly from the rotor at an angle relative to a radial plane in which the axial center line of the rotor is disposed and in a direction opposite to the direction of rotation of the rotor, and

the radially outermost end of each of said vanes comprises:

a first flat surface in abutment with the inner wall of the stator housing, said first surface being substantially perpendicular to the rear face of said vane, extending from the rear face for a distance of 1/10 to ½ the distance between the front and rear faces of the vane and terminating in a front edge, and

a second flat tapered surface extending inwardly from said front edge to said front face at an angle relative to the first surface which is 5° to 10° larger than said first-mentioned angle and terminating at the front face of said vane.

4,163,636

LIFTING DEVICE FOR WATER, WASTE WATER, SLUDGE AND THE LIKE

Bertram Botsch, Karlsruhe, and Werner Marzluf, Moersch, both of Fed. Rep. of Germany, assignors to Maschinenfabrik Hellmut Geiger, Postfach, Fed. Rep. of Germany

Division of Ser. No. 493,778, Aug. 1, 1974, Pat. No. 3,994,616. This application Jul. 22, 1976, Ser. No. 707,776

Claims priority, application Fed. Rep. of Germany, Aug. 2, 1973, 2339187; Jul. 15, 1974, 2433917

Int. Cl.[2] F04D *23/00*

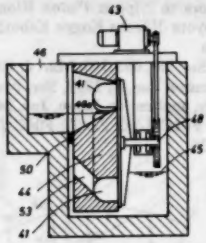
U.S. Cl. 415—6 **4 Claims**

1. A conveying device for conveying liquid from a supply well, comprising in combination:

an upright wall having two sides and including an annular groove defined in one side dipping into said well;

conveying means at least partially disposed in said well, and comprising a disk rotatably mounted about a substantially horizontal axis and a plurality of separations connected to said disk about said axis along a mean diameter corresponding to that of said groove, said separations substantially corresponding in outline to and moving in said groove, said disk and said separations and the surfaces of said groove defining cells for conveying said liquid through at least a part of said groove; and

an output channel defined in said wall and intercommunicating with a top portion of said groove for emptying liquid from said cells;



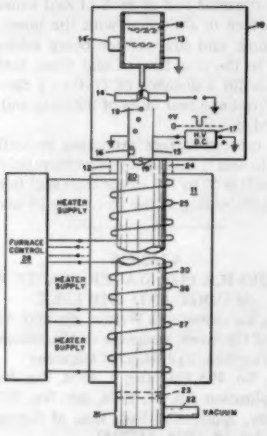
whereby, when said disk is rotated, it will move said separations into said liquid and said cells substantially will retain their liquid content until they reach said output channel.

4,163,637

METHOD AND APPARATUS FOR PRODUCING SMALL HOLLOW SPHERES

Charles D. Hendricks, Livermore, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Division of Ser. No. 807,108, Jun. 16, 1977, Pat. No. 4,133,854. This application Sep. 29, 1978, Ser. No. 947,665
Int. Cl.² B22D *11/01*
U.S. Cl. 425—6 **5 Claims**



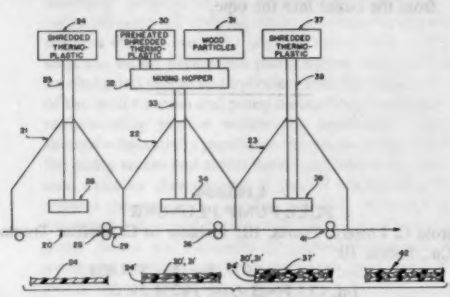
1. An apparatus for producing small hollow spheres of uniform diameter and wall thickness comprising a droplet generator and a multiple zone oven interconnected such that certain of the drops formed by said droplet generator pass through said multiple zone oven wherein said drops are dried and formed into hollow spheres, said droplet generator inluding means for forming drops of sphere forming material which are directed along a flow path to said multiple zone oven, means for electrically charging at least part of the drops, and means for deflecting said charged drops from along said flow path whereby only uncharged drops are directed into said oven; said multiple zone oven having means for controlling the temperature in each zone thereof such that each subsequent zone is of a high temperature.

4,163,638

MATERIAL DISTRIBUTION APPARATUS FOR CONTINUOUS FLOW MATERIAL SOURCE

Teddy V. Smith, 13437 Kit La., Dallas, Tex. 75240

Filed Aug. 22, 1977, Ser. No. 826,393
Int. Cl.² B29C *3/06*
U.S. Cl. 425—131.1 **6 Claims**



1. A material distribution apparatus for spreading an even layer of continuously flowing material bits on the working surface of a continuous conveyor means, which conveyor means is selectively advanceable in a predetermined direction, comprising a material flow-directing means, said material flow-directing means comprising a distribution head receiving said continuously flowing material bits; said distribution head being longitudinally, positionably, mounted on a mounting carriage, which carriage is transversely positionable over a predetermined expanse of said conveyor working surface, said distributor head having a dimension extending longitudinally along said conveyor working surface defined as one-third the distance defined by the longitudinal position extremes thereof on said mounting carriage; selectively reversible distributor carriage means connected to said distributor carriage, to continuously drive said carriage between respective transverse position extremes over said conveyor working surface; first control means effecting a reversal of said distributor carriage drive means upon each successive transverse position extreme of said carriage being effected; second control means effecting a longitudinal shift of said distributor head on said distributor head carriage, said longitudinal shift register being opposite the direction of advance of said conveyor means, and by a distance substantially equalling the longitudinal dimension of said distributor head; said longitudinal shift being effected upon said head being driven from an edge extreme home position to a first opposite transverse extreme, and upon said head being driven from said first opposite transverse extreme to a second opposite transverse extreme; and a third control means operable upon said distributor head being driven to a third opposite transverse extreme, to position a guide means into working relationship with said distributor head, to cause said head to follow a diagonal path back to said home position as said conveyor is advanced through a predetermined distance increment defined as four times the longitudinal dimension of said distributor head.

4,163,639

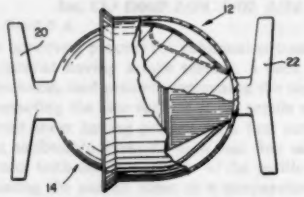
SNOWBALL MAKER

Robert G. Stern, 8 Sylvia Rd., North Reading, Mass. 01864, and W. Thomas Wallace, 82 Louise Rd., Chestnut Hill, Mass. 02167

Filed Dec. 19, 1977, Ser. No. 861,618
Int. Cl.² F25C *1/10*; B28B *3/00*
U.S. Cl. 425—318 **11 Claims**

1. A snowball maker comprising an outer shell and an inner shell, said shells being cup-like and being adapted to interfit in opposition with one another for compacting snow therein into a unitary mass, said inner shell having a hemispherical base portion conjoined and coaxial with a peripheral portion nor-

mally of tubular configuration and having an inner diameter which is non-diminishing upon progression from the closed end of the shell to the rim, and said inner shell peripheral portion having a plurality of circumferentially-spaced sections, said peripheral portion spaced sections being resiliently de-



formable radially inwardly to a closed abutting configuration upon telescopic interfitting of said peripheral portion within said outer shell for substantially encircling the snow within the two shells, said peripheral portion resiliently resuming said normal configuration thereof upon removal of the inner shell from the outer shell.

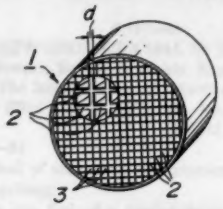
4,163,640

APPARATUS FOR EXTRUDING A HONEYCOMB STRUCTURAL BODY

Noboru Higuchi, Nagoya, and Shoji Futamura, Kawasaki, both of Japan, assignors to NGK Insulators, Ltd., Nagoya and Institute of Technology Precision Electrical Discharge Works, Kawasaki, both of, Japan

Filed May 30, 1978, Ser. No. 910,528
Claims priority, application Japan, Jun. 10, 1977, 52-68711
Int. Cl.[2] B29F *3/06*
U.S. Cl. 425—466 **2 Claims**

1. In a die apparatus for extruding a honeycomb structural body comprising a second core block having discharge slits of a cross-sectional shape corresponding to the cross-section of the honeycomb, said slits having a given depth toward the rear surface of the die from the front surface of the die, and a first core block wherein a plurality of independent feed inlets are formed toward the front surface side of the die from the rear surface of the die and connect to the discharge slits, both said blocks being constituted integrally, an improvement comprising that the first core block being divided in the direction which cross-sects the feed inlets to provide a gas reservoir composed of a recess formed by remaining the periphery portion of a plurality of feed inlets, and gas discharge apertures opening at the front surface of the die and perforating the



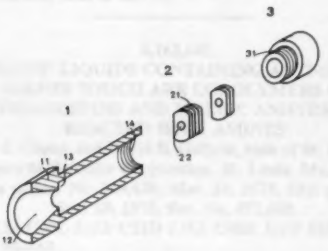
second block to flow gas from the gas reservoir through said gas discharge apertures.

4,163,641

EXTRUSION TOOL

Jean-Pierre Hulin, and Michel de Vecchis, both of Paris, France, assignors to Societe Lignes Telegraphiques et Telephoniques, Paris, France

Filed Jun. 26, 1978, Ser. No. 919,268
Claims priority, application France, Sep. 20, 1977, 77 28253
Int. Cl.[2] B29C *23/00*
U.S. Cl. 425—461 **5 Claims**



1. An extrusion tool consisting of a stack of a few tens of metal wafers a few tenths of millimeter thick made fast with one another, having apertures which are complementary to the profiles of the rods to be extruded said apertures being produced by chemical etching.

4,163,642

PROCESS FOR THE SUBLIMATION TRANSFER DYEING OF TEXTILE MATERIALS INCLUDING SUBSEQUENT CONDUCTIVE HEADING

Jackson Bauer, Croydon, Pa., assignor to Collins & Aikman Corporation, New York, N.Y.

Filed Jul. 7, 1977, Ser. No. 813,520
Int. Cl.[2] D06P *1/16, 5/02, 3/54*
U.S. Cl. 8—2.5 A 9 Claims

1. An improved process for sublimation transfer printing a textile material having a face surface, a back surface and a given thickness, said process comprising the steps of:

(a) contacting the face surface of the textile material with a carrier sheet having printed on a first surface thereof a heat sublimable dyestuff, with said first surface being in contact with the face surface of the textile material,

(b) heating the carrier sheet to a temperature sufficient to cause at least a portion of said dyestuff to sublime to a volatilized state,

(c) transferring at least a portion of dyestuff in the volatilized state to the face surface and partially through the thickness of the textile material adjacent to the face surface,

(d) condensing the dyestuff on the face surface and partially through the thickness of the textile material adjacent to the face surface,

(e) removing the carrier sheet from the face of the textile material,

(f) conductively heating the resulting printed face surface of the textile material by contact with a heated member to a temperature at least sufficient to revolatilize the dyestuff in the absence of dynamic directional gaseous convective fluids and liquids other than those generated by the conductive heating of said textile material,

(g) transferring a portion of the dyestuff in the volatilized state from the face of the textile material in a direction substantially perpendicular to the face of the textile material towards the back surface, and

(h) condensing the resublimed dyestuff in the interior of the textile material,

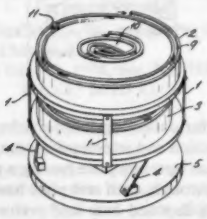
whereby a transfer printed textile material is obtained having improved dyestuff distribution with resulting improved resistance to resublimation, crocking and having improved wash fastness.

4,163,643

AUTOMATION OF DISCRETE ANALYSIS SYSTEMS

William M. Hunter, and John D. Lock, both of Edinburgh, Scotland, assignors to National Research Development Corporation, London, England

Filed Nov. 29, 1977, Ser. No. 855,768
Claims priority, application United Kingdom, Dec. 3, 1976, 50517/76
Int. Cl.[2] G01N *1/10*
U.S. Cl. 23—230 R 23 Claims



1. A method of conveying samples in a discrete sample analysis apparatus wherein at least one discrete test sample is placed in at least one sample container, comprising:

supporting the at least one sample container on a conveyor track; and,

vibrating the conveyor tracks such that the sample container is conveyed along the track.

4,163,644

SUSPENSION OF COAL IN FUEL OILS

Wayne E. Bowers, Byram Township, Sussex County, N.J., assignor to The Rolfite Company, Stamford, Conn.

Filed Apr. 25, 1978, Ser. No. 899,799
Int. Cl.[2] C10L *1/32*
U.S. Cl. 44—51 12 Claims

1. A method of stabilizing a suspension of coal particles in fuel oil comprising:

(a) mixing into fuel oil a predetermined amount of a polyfunctional amine selected from the group consisting of N-alkyl 1,3 diamino propanes and higher N-alkyl amines having more than two amino groups;

(b) adding to the amine-fuel oil mixture of (a) pulverized coal and agitating the resulting mixture to create a suspension of the coal in the fuel oil, said coal being in the form of at least about 70% by weight of particles which are capable of passing through a 200 Tyler mesh screen and containing no more than about 1.0% by weight of particles larger than 50 mesh;

(c) adding to the amine-fuel oil-coal mixture of (b) an amount of a polyfunctional carboxylic acid containing at least two carboxyl groups sufficient to react with the amine of (a) and thereby to stabilize the suspension of pulverized coal in fuel oil.

4,163,645

ORGANIC LIQUIDS CONTAINING ANTI-STATIC AGENTS WHICH ARE COPOLYMERS OF ALPHA-OLEFINS AND MALEIC ANHYDRIDES REACTED WITH AMINES

William J. Cheng, and David B. Guthrie, both of St. Louis, Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Division of Ser. No. 344,420, Mar. 23, 1973. This application Jan. 23, 1978, Ser. No. 871,668
Int. Cl.[2] C10L *1/22;* C11D *1/62;* C08K *5/19;* C08F *8/32*
U.S. Cl. 44—62 15 Claims

1. An organic liquid containing a minor amount, sufficient to impart anti-static properties, of the product formed by reacting a copolymer of an alpha-olefin and maleic anhydride with a primary amine, a secondary amine or mixtures thereof in the presence of a Lewis acid, the molar ratio of amine to maleic anhydride in the copolymer being from about 0.25 to about 3.

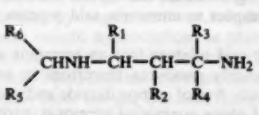
4,163,646

FUEL OILS CONTAINING N,N-SUBSTITUTED DIAMINES

Bernardus A. Oude Alink, St. Louis, and Neil E. S. Thompson, Creve Coeur, both of Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Division of Ser. No. 597,564, Jul. 21, 1975, and Ser. No. 292,494, Sep. 27, 1972, Pat. No. 4,085,104. This application Dec. 30, 1976, Ser. No. 755,535
Int. Cl.[2] C10L *1/22*
U.S. Cl. 44—73 14 Claims

1. Fuel oil containing a stabilizing amount of a stabilizer consisting of a compound of the formula



where R_5 and R_6 are groups selected from the group consisting of alkyl, aryl, cycloalkyl, alkaryl, and aralkyl and R_1, R_2, R_3, and R_4 are hydrogens or a group selected from the group consisting of alkyl, aryl, cycloalkyl, alkaryl and aralkyl.

4,163,647

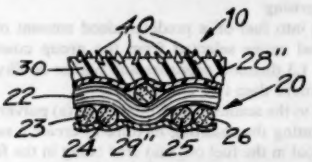
METHOD FOR PRODUCING COATED ABRASIVES

Henry J. Swiatek, Schenectady, N.Y., assignor to Norton Company, Worcester, Mass.

Continuation of Ser. No. 346,314, Apr. 5, 1973, abandoned, which is a continuation of Ser. No. 156,046, Jun. 23, 1971, abandoned, which is a continuation of Ser. No. 744,218, Jul. 11, 1968, abandoned. This application Oct. 21, 1974, Ser. No. 516,215

Int. Cl.[2] C09K *3/14*

U.S. Cl. 51—295 5 Claims



4. A process for preparing a coated abrasive, including the steps of providing a cloth backing material having a plurality of warp and fill yarns intersecting with one another forming interstices there-between and said backing material having a front side and a back side, applying a maker adhesive coating on said front side, and depositing abrasive grains on said maker adhesive coating, wherein the improvement comprises:

(a) passing said cloth backing material to a liquid polymer coating means, the front side of said backing material contacting said coating means while facing in a downward position relative thereto;

(b) applying a coating of an aqueous solution of a heat-hardenable phenol-formaldehyde resin to said front side, said phenol-formaldehyde resin having a viscosity of from 1500 to 15,000 centipoises;

(c) spreading said coating of liquid resin and removing the excess thereof with a wiping motion, thereby forming a continuous layer of liquid resin on the surface of the front side in an amount of from 4.5 to 7.5 pounds per sandpaper makers ream, without substantial penetration of said interstices of the cloth backing material by said phenol-formaldehyde resin;

(d) heating the resin coated backing material to render the coating tack free;

(e) cooling the resin coated cloth to ambient temperature so as to prevent premature curing of the liquid resin.

4,163,648

PROCESS FOR SEPARATION OF AMMONIA AND CARBON DIOXIDE

Andreas J. Biermans, Urmond, Netherlands, assignor to Stamicarbon, B.V., Geleen, Netherlands

Filed Nov. 1, 1977, Ser. No. 847,654

Claims priority, application Netherlands, Nov. 3, 1976, 7612163

Int. Cl.[2] B01D *53/14, 19/00*

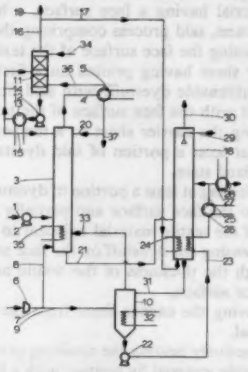
U.S. Cl. 55—70 24 Claims

1. A process for the separate recovery of ammonia substantially free of carbon dioxide and water, and carbon dioxide substantially free of ammonia and water, from a mixture essentially containing ammonia and carbon dioxide, which mixture is rich with respect to ammonia, said process comprising the steps of:

introducing said mixture into an ammonia separation zone and separately removing therefrom an ammonia off-gas substantially free of carbon dioxide and water, and a residual liquid phase containing ammonia, carbon dioxide and water;

introducing said residual liquid phase from said ammonia separation zone into a carbon dioxide separation zone and separately removing therefrom a carbon dioxide off-gas substantially free of ammonia and water, and a residual liquid phase containing ammonia, carbon dioxide and water;

introducing said residual liquid phase from said carbon dioxide separation zone into a desorption zone and separately removing therefrom a desortion zone off-gas containing ammonia, carbon dioxide and water vapor, and a liquid phase of desorption water substantially free of ammonia and carbon dioxide; and



introducing said desorption zone off-gas into said ammonia separation zone;

wherein the system pressure in said carbon dioxide separation zone is no greater than twice the system pressure in said ammonia separation zone, and diluting water is introduced into said carbon dioxide separation zone in an amount of between 0.2 and 6 times, by weight, the total weight of said residual liquid phase from said ammonia separation zone introduced into said carbon dioxide separation zone.

4,163,649

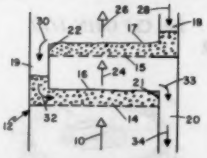
COLLECTION OF FINE PARTICLES FROM A GAS STREAM BY MOVING THE GAS STREAM UPWARD THROUGH A SHALLOW BED OF SOLID GRANULES

Seymour Calvert, San Diego, Calif., assignor to A.P.T., Inc., San Diego, Calif.

Filed Dec. 15, 1977, Ser. No. 857,441

Int. Cl.[2] B01D *46/32*

U.S. Cl. 55—99 6 Claims



1. A method for collecting fine particles from a gas stream by inertial impaction and interception comprising the steps of:

(a) providing at least one plate having a plurality of perforations therethrough, each said plate having a bed of collector granules disposed over said perforations;

(b) moving said bed of collector granules across each said plate;

(c) directing said stream of gas containing said fine particles through said perforations so as to form gas jets; and

(d) impacting said gas jets on said collector granules, said gas jets having sufficient velocity such that said fine particles are collected by said collector granules by inertial impac-

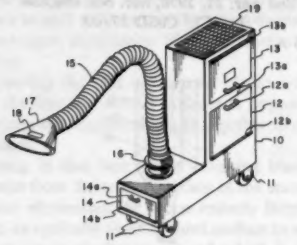
tion and interception, and said bed of collector granules is only deep enough in relation to the velocity of said gas jets so as to prevent said gas jets from penetrating said bed without said fine particles being collected by said collection granules.

4,163,650

PORTABLE ELECTRONIC PRECIPITATOR

Clifford A. Watson, and David W. Bonham, both of Garland, Tex., assignors to Tepco, Incorporated, Garland, Tex.

Filed Jul. 24, 1978, Ser. No. 927,541
Int. Cl.[2] B03C 3/01
U.S. Cl. 55—126 **10 Claims**



1. A portable electronic precipitator apparatus which comprises:

a. a portable cabinet structure;

b. An enlarged particle fallout chamber formed by the lower portion of said cabinet structure;

c. a two-stage type electrostatic precipitator contained within said cabinet structure with the inlet of said electrostatic precipitator being in open communication with said particle fallout chamber and with the outlet of said electrostatic precipitator being oriented to direct a gas stream out of said cabinet structure;

d. an adjustable freestanding arm assembly affixed to and supported by said cabinet structure;

e. an elongated flexible duct means surrounding and supported by said adjustable arm assembly with one end of said duct means being in open communication with said particle fallout chamber; and

f. means to direct a gas having particulate material suspended therein into the free end of said flexible duct means whereby said gas flows through duct means, into said particle fallout chamber, through said two-stage electrostatic precipitator for removal of at least a portion of the particulate material from said gas and then to direct the thus cleaned gas out of said cabinet structure.

4,163,651

PAPER CHIP COLLECTING AND COMPACTING APPARATUS

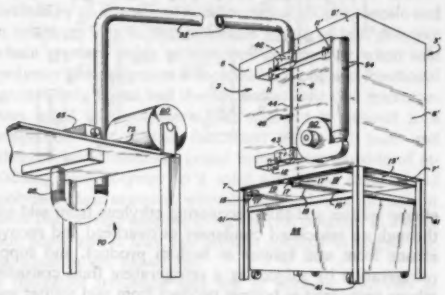
Joseph J. Dohnalik, Chicago, Ill., assignor to Garden City Envelope Company, Chicago, Ill.

Filed Dec. 27, 1976, Ser. No. 754,108
Int. Cl.[2] B01D 45/00
U.S. Cl. 55—344 **8 Claims**

5. A waste bin for pneumatically collecting, storing and compacting paper chips comprising:

a chamber for receiving, compacting and collecting said paper chips, said chamber having an upper portion and a lower portion in which said paper chips are stored and compacted, and having an inlet port in said upper portion for introducing into said upper portion of said chamber a stream of air containing said paper chips and an outlet port in said lower portion for withdrawing from said lower portion of said chamber a stream of air from which substantially all of said paper chips have been removed, said chamber also having a side member and a bottom member, all of said separated paper chips being collected, stored and compacted on said bottom;

perforated screen means in the interior of said chamber for separating substantially all of said paper chips from said stream of air being introduced into said chamber, said perforated screen means having perforations dimensioned sufficiently large to permit the passage of air therethrough and sufficiently small to prevent the passage of said paper chips therethrough, and said perforated screen means being so constructed and positioned within said chamber as to permit free passage into said chamber of said stream of air containing said paper chips, to separate substantially all of said paper chips from said stream of air, to allow said separated paper chips to be collected, stored and compacted in said lower portion of said chamber, and to allow withdrawal from said lower portion of said chamber of a stream of air from which substantially all of said paper



chips have been removed, said perforated screen means comprising a substantially vertical container formed of perforated screen and having upper and lower portions and top and side members, being open at its bottom, and having an inlet port in said upper portion thereof for entry of said paper chips therein, said container extending from said upper portion of said chamber downward, and abutting said bottom member; and a tube having its ends attached to the inlet ports in said container and said chamber to provide a conduit for passage of said paper chips into said substantially vertical container;

said inlet and outlet ports so positioned in said chamber as to cause, in cooperation with said perforated screen means, all of said paper chips collected and stored therein to be compacted by the downward flow of air from said inlet port through said perforated screen means and to said outlet port of said chamber.

4,163,652

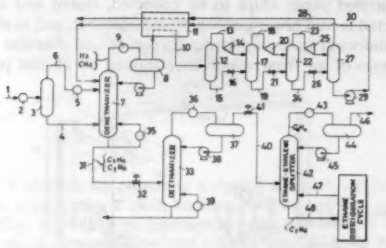
REFRIGERATIVE FRACTIONATION OF CRACKING-GASES IN ETHYLENE PRODUCTION PLANTS

Luigi Gazzi, Milan, and Oronzo Sguera, San Donato Milanese, both of Italy, assignors to Snamprogetti S.p.A., Milan, Italy

Filed Mar. 24, 1977, Ser. No. 781,064
Claims priority, application Italy, Mar. 26, 1976, 21580 A/76
Int. Cl.[2] F25J 3/02
U.S. Cl. 62—28 **7 Claims**

1. A process for the refrigerative fractionation of the cracking gases containing hydrogen, methane, ethylene, ethane and higher molecular weight hydrocarbons in plants for the production of ethylene, which comprises refrigerating said cracking gases to form a liquid fraction and a gas fraction, separating the liquid fraction from the gas fraction, further refrigerating the gas fraction, feeding said liquid fraction and the further refrigerated gas fraction to a demethanizing stage, recovering hydrogen and methane together with relevant amounts of ethylene and ethane from said demethanizing stage as overhead and recovering ethylene and ethane together with higher

molecular weight products from said demethanizing stage as bottom product, condensing a part of said overhead product by refrigeration and feeding said condensed portion to a reflux storage tank, refluxing a condensed portion of the overhead from the reflux storage tank to said demethanizing stage, cooling the uncondensed portion of said overhead, subjecting said uncondensed portion of overhead to a series of expansion and separation stages in order to recover ethylene and ethane therefrom, recycling said recovered ethylene and ethane to said demethanizing stage, distilling said bottom product so that a stream of ethylene and ethane is separated therefrom, feeding said separated stream of ethylene and ethane to an ethylene-



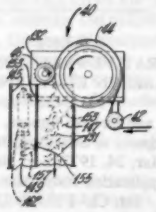
ethane splitter and then recovering ethylene from said splitter through an associated condenser as overhead and recovering ethane from said splitter as bottom product, and supplying refrigeration by subjecting a refrigerating fluid consisting of ethane recovered as bottom product from said splitter and fed to an ethane refrigerating cycle comprised of a series of compression and expansion stages, and condensing said refrigerating ethane after the last compression stage, so as to produce a refrigeration effect down to the boiling temperature of −88° C. of ethane at atmospheric pressure, wherein cooling water having a temperature in the range of from 0° to 25° C. is utilized in condensing said refrigerating ethane.

4,163,653

METHOD AND APPARATUS FOR FORMING AND COLLECTING DISCRETE FIBERS AND/OR STRANDS

Alex P. Symborski, Anderson; Ray M. Fulmer, Aiken, both of S.C., and David W. Thomas, Newark, Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Aug. 28, 1978, Ser. No. 937,380
Int. Cl.² C03B *37/02*
U.S. Cl. 65—2 **5 Claims**



4. The method of forming and collecting discrete segments of fibrous glass comprising:

supply a plurality of streams of molten glass;

attenuating the streams into filaments and cutting the continuous filaments into discrete segments by an attenuation means;

positioning a delivery means having a first collection zone and a second collection zone spaced from the first zone to receive said discrete fibers;

controlling said attenuation means to operate at a first speed or a second speed slower than the first speed; and

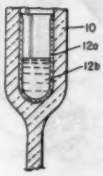
directing the discrete segments to said first zone when said attenuation means is operated at said first speed and to said second zone when said forming means is operated at said second speed.

4,163,654

METHOD OF MANUFACTURING GRADED INDEX OPTICAL FIBERS

David A. Krohn, Hamden, and Seymour Merrin, Fairfield, both of Conn., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Apr. 21, 1978, Ser. No. 898,838
Int. Cl.² C03D *37/00*
U.S. Cl. 65—3 A **1 Claim**



1. A process for making a graded index optical fiber, comprising the steps of:

introducing the batch material for a first core glass into a closed tube of fused silica having a refractive index less than that of the first core glass;

melting said batch material to form a glassy liquid within the said tube;

rotationally casting a layer of said glassy liquid on the inner wall of said tube;

introducing the batch material for a second core glass into said coated tube, the refractive index of said second core glass being greater than that of said first core glass;

melting the batch material for said second core glass to form a glassy liquid within said coated tube; and

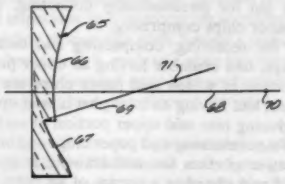
drawing said tube and said first and second glassy liquids into said optical fiber.

4,163,655

METHOD OF MANUFACTURE OF MOLDS FOR RESIN OPHTHALMIC LENSES HAVING A SEGMENT WITH PRISMATIC OPTICAL EFFECT

Charles D. Campbell, La Jolla, Calif., assignor to Signet Optical Corporation, San Diego, Calif.

Continuation-in-part of Ser. No. 881,131, Feb. 24, 1978, which is a continuation-in-part of Ser. No. 765,537, Feb. 4, 1977, abandoned, and a continuation-in-part of Ser. No. 876,323, Feb. 9, 1978, which is a continuation-in-part of Ser. No. 765,536, Feb. 4, 1977, abandoned. This application May 1, 1978, Ser. No. 901,411
Int. Cl.² C03B *23/20, 19/00, 11/08*
U.S. Cl. 65—17 **17 Claims**



1. A method for making a mold for the casting of resin

ophthalmic lenses and the like having a segment locally of the lens which has prismatic optical effect relative to the remainder of the lens, the method including the steps of

(a) forming in one face of a first blank an optically finished first surface which is a portion of a first surface of revolution having a first axis of symmetry,

(b) providing a second blank of characteristics sufficiently compatible with those of the first blank that the first and second blanks can be stably adhered together and which has formed at least partially therethrough a recess of predetermined size and perimetral shape,

(c) forming in one side of the second blank a second surface which is essentially reversely curved to that of the first surface in such manner that the recess opens to the second surface upon completion of the formation of the second surface,

(d) registering the first and second blanks with each other with the first and second surfaces in opposition,

(e) adhering the registered blanks together to define a resulting blank,

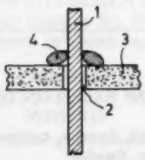
(f) forming in that face of the resulting blank which was opposite from the second surface of the second blank, and without eliminating the recess entirely from the resulting blank, an optically finished third surface to which the first surface opens via the recess and which is a portion of a second surface of revolution having a second axis of symmetry with an effective center of curvature located along the second axis, including forming the third surface in such manner that the first and second axes intersect, if at all, at a location on the second axis other than at substantially said center of curvature.

4,163,656

METHOD OF MANUFACTURING A LEAD-THROUGH OF A METAL ELEMENT THROUGH A CERAMIC COMPONENT BY MEANS OF SEALING

Marc A. Monneraye, Aubervilliers, and Michel J. C. Monnier, Montgeron, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 15, 1973, Ser. No. 370,400
Claims priority, application France, Jun. 21, 1972, 72.22323
Int. Cl.[2] C03C *27/04*
U.S. Cl. 65—43 3 Claims



1. A method of manufacturing a lead-through of a metal element consisting of a fernico alloy through a component of ceramic material by means of sealing with the aid of a glass type based on zinc-borosilicate, comprising supplying a suspension of glass powder whose molar quantity percentage composition is between the following limits

SiO_2:4–26
B_2O_3:19–56
ZnO:29–57
Li_2O:3.0–5.0
Al_2O_3:0–6

depositing said suspension on the ceramic material at the area of the lead-through, heating the assembly for several minutes in a nitrogen atmosphere at a temperature near 1000° C. and cooling the assembly to room temperature.

4,163,657

SOIL CONDITIONING COMPOSITION AND METHOD OF USING SAME

Evan E. Koslow, Westport, Conn., and J. Samuel Batchelder, Katonah, N.Y., assignors to Koslow-Batchelder Technologies, New Haven, Conn.

Filed Jun. 23, 1978, Ser. No. 918,335
Int. Cl.[2] C05F *11/00*
U.S. Cl. 71—27 29 Claims

15. The method of retarding the loss of water from a water-permeable soil comrising the steps of:

(A) contacting said soil with a soil conditioning composition comprising a substantially linear, substantially water-soluble hydrophilic polymer having a molecular weight greater than 50,000 and at least one functional group disposed along the polymer chain, said polymer chain comprising one or more polymer chain segments characterized by an absence of said functional groups therein and a minimum length, said minimum length of said polymer chain segment being at least one micrometer when said polymer chain segment is secured to one of said functional groups only at one end thereof and at least two micrometers when said polymer chain segment is secured to a respective one of said functional groups at each end thereof, said functional group being more capable of attaching said polymer to a solid soil phase than is said polymer chain segment; whereby said polymer includes at least one portion adapted to secure said polymer to a solid soil phase and at least one portion adapted to extend into an aqueous soil phase; and

(B) thereafter irrigating said soil at periodic intervals as required to maintain the water content of said soil.

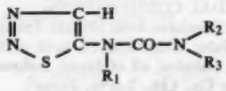
4,163,658

1,2,3-THIADIAZOLE-5-YL-UREA DERIVATIVES, PROCESS FOR MAKING THE SAME AND PLANT RETARDATION AND DEFOLIATION COMPOSITION CONTAINING SAME

Friedrich Arndt; Hans-Rudolf Krüger, and Reinhart Rusch, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Division of Ser. No. 792,016, Apr. 28, 1977, Pat. No. 4,130,414.
This application Aug. 16, 1978, Ser. No. 934,191
Claims priority, application Fed. Rep. of Germany, May 3, 1976, 2619861
Int. Cl.[2] A01N *9/22*; C07D *417/12*
U.S. Cl. 71—73 6 Claims

1. A 1,2,3-thiadiazole-5-yl-urea compound of the formula



in which

R_1 is hydrogen or alkyl of 1 to 5 carbon atoms;

R_2 is hydrogen or alkyl of 1 to 5 carbon atoms which may be substituted like R_3 below

R_3 is a pyrimidine residue, which residue may also be substituted by one or more of the same or different substituents, the substituents being selected from the group consisting of alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, halogen, nitro- and trifluoromethyl.

6. A method of causing growth retardation and defoliation in plants comprising applying to the plant or to the ground in which the plant is grown the composition of claim 4 in an amount of about 0.05 to 5 kg per about 2.5 acres of ground.

4,163,659

STUNTING PLANT GROWTH WITH N-SUBSTITUTED PERFLUOROALKANESULFONAMIDES

Joseph K. Harrington, Edina; Donald C. Kvam, North Oaks; Arthur Mendel, Vadnais Heights, and Jerry E. Robertson, North Oaks, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 618,376, Oct. 1, 1975, Pat. No. 4,076,519, which is a division of Ser. No. 352,596, Apr. 19, 1973, Pat. No. 3,920,444, which is a continuation-in-part of Ser. No. 100,404, Dec. 21, 1970, abandoned, which is a division of Ser. No. 832,829, Jun. 12, 1969, Pat. No. 3,639,474, which is a continuation-in-part of Ser. No. 588,338, Oct. 21, 1966, abandoned. This application Jan. 3, 1978, Ser. No. 866,369

Int. Cl.[2] A01N 5/00

U.S. Cl. 71—76 2 Claims

1. A method for the control of grass growth rate by means of retardation which comprises contacting grass with an effective inhibiting amount of 5-acetamido-2-methyltrifluoromethanesulfonanilide, or salt thereof.

4,163,660

BIS-SUBSTITUTED SUCCINAMIDES AND THEIR UTILITY AS HERBICIDES

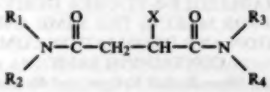
Francis H. Walker, Mill Valley, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 546,234, Feb. 3, 1975, Pat. No. 4,056,524, which is a continuation-in-part of Ser. No. 459,438, Apr. 9, 1974, abandoned, which is a continuation-in-part of Ser. No. 410,641, Nov. 12, 1973, abandoned. This application Aug. 4, 1977, Ser. No. 821,887

Int. Cl.[2] A01N 9/00, 9/22

U.S. Cl. 71—88 9 Claims

1. A method for controlling the growth of undesirable vegetation which comprises applying to the area where control of said vegetative growth is desired, an herbicidally effective amount of a compound having the formula



in which X is chlorine or bromine; R_1 and R_2 taken together along with the nitrogen form a non-aromatic heterocyclic ring having from 2 to 8 carbon atoms, inclusive; R_3 and R_4 taken together along with the nitrogen form a non-aromatic heterocyclic ring having from 2 to 8 carbon atoms, inclusive.

4,163,661

PHENOXYPHENOXY CROTONIC ACID DERIVATIVES AND HERBICIDAL COMPOSITION

Kazuo Jikihara, Kakegawa; Shigekazu Itoh; Shuichi Takayama, both of Shimizu; Koichi Sato; Ichiro Kimura, both of Shizuoka, and Isao Chiyomaru, Shimizu, all of Japan, assignors to Kumiai Chemical Industry Co., Ltd., Tokyo, Japan

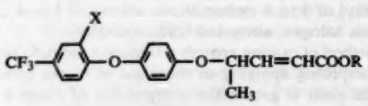
Filed Jun. 26, 1978, Ser. No. 919,272

Claims priority, application Japan, Oct. 31, 1977, 52/130394; Feb. 14, 1978, 53/15654

Int. Cl.[2] C07C 69/76; A01N 9/24

U.S. Cl. 71—108 8 Claims

1. A trifluoromethylphenoxy phenoxy crotonic acid derivative having the formula



(I)

wherein X represents hydrogen or halogen atom, and R represents an alkyl, haloalkyl, alkenyl, haloalkenyl or alkynyl group.

4,163,662

LIQUID FORMULATIONS OF 1-(3,4-DICHLOROPHENYL)-3-METHOXY-3-METHYLUREA AND SELECTED CHLOROACETAMIDES

Harris M. Baker, Jr., Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 665,328, Mar. 9, 1976, abandoned, which is a continuation-in-part of Ser. No. 581,952, May 29, 1975, abandoned, which is a continuation of Ser. No. 320,479, Jan. 2, 1973, abandoned, which is a continuation-in-part of Ser. No. 33,912, May 1, 1970, abandoned, which is a continuation-in-part of Ser. No. 814,167, Apr. 7, 1969, abandoned, which is a continuation-in-part of Ser. No. 781,597, Dec. 5, 1968, abandoned, which is a continuation-in-part of Ser. No. 732,018, May 27, 1968, abandoned. This application Mar. 21, 1977, Ser. No. 779,825

Int. Cl.[2] A01N 9/20

U.S. Cl. 71—120 18 Claims

1. A solution concentrate of an herbicidal formulation comprising from 15–50% by weight of a mixture of 1-(3,4-dichlorophenyl)-3-methoxy-3-methylurea and a chloroacetanilide selected from the group consisting of 2-chloro-N-isopropyl acetanilide and 2-chloro-2',-6'-diethyl-N-(methoxymethyl)acetanilide, in which the weight ratio of said methylurea compound to said chloroacetanilide is 1:1 to 1:3, dissolved in a solvent system comprising (i) 100 to 60% by weight of at least one material selected from the group consisting of an aromatic hydrocarbon solvent, liquid aromatic halocarbon solvent and a liquid aliphatic halocarbon solvent and (ii) 0 to 40% by weight of a cosolvent; said aromatic hydrocarbon solvent having a distillation point in the range between about 132° and 371° C. at atmospheric pressure and a flash point above 26° C., comprising more than 80% by weight of aromatics selected from alkylated benzenes and alkylated naphthalenes; said aromatic halocarbon being selected from monochlorobenzene, o-dichlorobenzene, trichlorobenzene and bromobenzene; and said liquid aliphatic halocarbon being one containing from one to three carbon atoms, at least one hydrogen atom and two or more halogen atoms per molecule; said concentrate having a greater amount of said methylurea dissolved in said solvent system than would dissolve therein in the absence of said chloroacetanilide.

4,163,663

REFINING PROCESS BASED ON TOP-BLOWING WITH OXYGEN

Onni Pusa, Oxelösund, Sweden, assignor to Svenskt Stål Aktiebolag, Stockholm, Sweden

Filed Nov. 7, 1977, Ser. No. 849,005

Claims priority, application Fed. Rep. of Germany, Nov. 8, 1976, 2650978

Int. Cl.[2] C21C 5/32, 5/30

U.S. Cl. 75—60 13 Claims

1. A process for refining iron melts comprising blowing a stream of oxygen onto the upper surface of an iron melt for a predetermined blowing time, the quantity of the oxygen fed per unit of time being kept constant until the intensity of refinement begins to abate, reducing the flow of oxygen in a first stage by about 10 to 50%, continuing blowing oxygen at said reduced flow of oxygen until slag on the surface of the melt begins to sputter, removing the slag, further reducing the flow of oxygen in a second stage by about 20 to 80%, and completing the blowing process with said last-mentioned further reduced flow of oxygen.

4,163,664

PROCESS FOR PRECIPITATING PRECIOUS METALS FROM SOLUTIONS WHICH CONTAIN THEM

Renato Ugo, Cinisello Balsamo, Italy, assignor to PROTEC Processi e Tecnologie S.p.A., Milan, Italy

Continuation of Ser. No. 780,430, Mar. 22, 1977, abandoned, which is a continuation of Ser. No. 666,430, Mar. 12, 1976, abandoned.
This application Jan. 4, 1978, Ser. No. 866,904
Claims priority, application Italy, Mar. 27, 1975, 21716 A/75
Int. Cl.[2] C22B *11/04*
U.S. Cl. 75—108 6 Claims

1. A process for the substantially total precipitation of precious metal selected from the group consisting of platinum, palladium, gold, silver, ruthenium, rhodium, osmium and iridium from a solution containing the ions thereof in a concentration of less than 10 ppm, which comprises treating said solution with carbon monoxide at a pH between 0 and 7, at a temperature between 20° and 200° C. and at a carbon monoxide pressure between 1 and 100 atmospheres in the presence of a quantity of water or a primary or secondary alcohol at least equal in weight to the total quantity of precious metals present, until the amount of metals remaining in solution is less than 1 ppm.

4,163,665

ALUMINUM ALLOY CONTAINING MANGANESE AND COPPER AND PRODUCTS MADE THEREFROM

Kenneth R. Pearson, Riverside, Calif., assignor to Alumax Mill Products, Inc., Riverside, Calif.

Filed Jun. 19, 1978, Ser. No. 916,943
Int. Cl.[2] C22F *1/04*
U.S. Cl. 75—143 2 Claims

1. An aluminum alloy sheet metal stock prepared from a continuously cast aluminum alloy casting consisting essentially of:

A. Residual silicon up to 0.60 percent;
B. Residual iron up to 0.70 percent;
C. Residual zinc up to 0.30 percent;
D. 0.05 to 0.20 percent copper;
E. 0.40 to 0.90 percent manganese; and
F. Balance essentially aluminum

said casting being homogenized by heating;

said homogenized alloy being cold rolled to a desired gauge with a plurality of cold rolling passes including first and last cold rolling passes; and

said cold rolled alloy being annealed at least once intermediate said first and last cold rolling passes.

4,163,666

HYDROGEN CHARGED ALLOYS OF $ZR(A_{1-x}B_x)_2$ AND METHOD OF HYDROGEN STORAGE

David Shaltiel, 29 Keren Hayesod St.; Dan Davidov, 18 Neve Shaanan, and Isaac Jacob, 14 Kedish Luz St., all of Jerusalem, Israel

Filed Jan. 31, 1978, Ser. No. 873,946
Int. Cl.[2] F17C *11/00*
U.S. Cl. 75—177 10 Claims

1. A compound comprising a hydride of an alloy of the general formula

$$Zr(A_{1-x}B_x)_2$$

wherein A desigantes Mn, V or Cr, B fesignates Fe or Co and x is a value between 0.25 and 0.75.

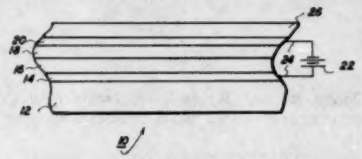
4,163,667

DEFORMABLE IMAGING MEMBER USED IN ELECTRO-OPTIC IMAGING SYSTEM

Joseph J. Wysocki, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 11, 1973, Ser. No. 405,364
Int. Cl.[2] G03G *5/04, 16/00;* G11C *11/44;* G02B *7/06*
U.S. Cl. 96—1.5 N 28 Claims

1. An imaging member comprising a layer of photoconductive material, an electric field deformable elastomer layer having a volume resistivity above about 10^4 ohm-cm overlying said photoconductive material layer and flexible conductive metallic layer comprising titanium and silver overlying said elastomer layer, said elastomer layer being capable of deforming to correspond to an electrical field pattern created by altering an electrical field across said elastomer layer by exposing the photoconductive material to electromagnetic radiation to which it is sensitive.



4,163,668

Patent Not Issued For This Number

4,163,669

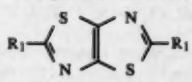
MULTILAYER SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL

Eiji Kanada; Noboru Itoh; Hiroshi Ikeda, and Tamotsu Iwata, all of Nagaokakyo, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

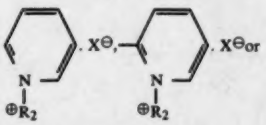
Filed Mar. 30, 1978, Ser. No. 891,925
Claims priority, application Japan, Apr. 27, 1977, 52-48945
Int. Cl.[2] G03C *1/76, 1/06, 1/34, 1/30*
U.S. Cl. 96—74 8 Claims

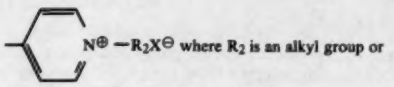
1. In a multilayer silver halide color photographic sensitive material to be bleached and fixed or to be subjected to one bath bleaching and fixing treatment after color developing step, the improvement characterized in that said material has in a support and on a support blue-sensitive, green-sensitive and red-sensitive silver halide emulsion layers and in at least one photographic layer a salt with a heavy metal ion of at least one compound selected from the group consisting of

(1) mercaptotriazoles,
(2) mercaptothiadiazoles,
(3) mercaptoimidazoles,
(4) mercaptoimidazolines,
(5) mercaptotetrazoles,
(6) mercaptopynimidines,
(7) mercaptopurines,
(8) mercaptoquinolidines,
(9) compounds of the general formula



wherein, R_1 represents



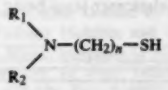


$R_2X^{\ominus}$ is $+CH_2\rightarrow_n SO_3^{\ominus}$, n being 3 or 4, and $\ominus$ is an anion;

(10) monothioglycerol,
(11) cystine,
(12) cystamine,

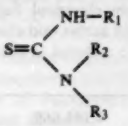
(13) cysteine,

(14) aminoalkylene thiols of the general formula



wherein R_1 and R_2 each represents hydrogen atom, methyl or ethyl group and n represents an integer from 1 to 3,

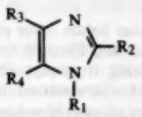
(15) thiourea derivatives of the general formula



wherein R_1 and R_2 each represents an an alkyl group, hydroxyalkyl group, phenyl group or allyl group, R_1 and R_2 may jointly form a hetero ring, and R_3 represents an alkyl, hydroxylalkyl or allyl group when R_1 and R_2 do not form a hetero ring and an alkyl group or hydroxyalkyl group when R_1 and R_2 jointly form a hetero ring;

(16) thioamide compounds of the general formula $R\text{-}CSNH_2$, wherein R represents hydrogen atom or an alkyl group having 1 to 16 carbon atoms; and

(17) imidazole compounds having the general formula:



wherein R_1-R_4 each represents hydrogen atom, an alkyl group, a hydroxylalkyl group or an alkenyl group, and

(18) thiazolidines.

4,163,670

COLOR PHOTOGRAPHIC MATERIAL

Keisuke Shiba; Takeshi Hirose; Atsuaki Arai; Akio Okumura, and Yukio Yokota, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

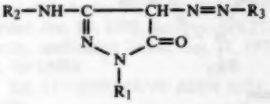
Filed Apr. 22, 1974, Ser. No. 462,842

Claims priority, application Japan, Apr. 21, 1973, 48/45971

Int. Cl.[2] G03C *1/76, 1/40*

U.S. Cl. 96—74 **11 Claims**

1. A color photographic material comprising a support having thereon at least one silver halide emulsion layer containing a colored coupler represented by the general formula (I)



wherein R_1 represents a phenyl group or a 5- or 6-membered heterocyclic ring selected from the group consisting of a 2-thiazolyl ring, a 2-benzothiazolyl ring, a 2-benzoxazolyl ring, a 2-oxazolyl ring, a 2-imidazolyl ring, and a 2-benzimidazolyl ring; R_2 represents a phenyl group having a halogen atom, an alkoxy group, or an aryloxy group at the ortho-position to the imino group bonded to the 3-position of the pyrazolone ring, and R_3 represents a phenyl group having a hydroxyl group at the para-position to the azo group and at least one alkyl group having 1 to 8 carbon atoms at one of the meta-positions to the azo group of the pyrazolone ring, said coupler molecule having a hydrophobic diffusion resisting group in the molecule.

4,163,671

SILVER HALIDE PHOTOGRAPHIC MATERIAL CONTAINING ULTRAVIOLET LIGHT ABSORBING AGENT

Atsuo Inoue, and Takeshi Mikami, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

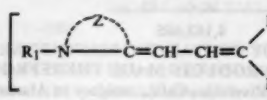
Filed Apr. 17, 1978, Ser. No. 896,871

Claims priority, application Japan, Apr. 25, 1977, 52-47620

Int. Cl.[2] G03C *1/84, 1/72, 1/76,*

U.S. Cl. 96—74 **20 Claims**

1. A silver halide photographic material comprising a support having thereon at least one photosensitive silver halide emulsion layer with the silver halide photographic material containing at least one compound represented by the general formula (I)



(I)

wherein Z represents the atoms necessary for forming a pyrrolidine nucleus or a thiazolidine nucleus; R_1 represents an alkyl group or an aryl group; R_2 and R_3, which may be the same or different, each represents a cyano group or $—COOR_4$; R_4 represents an alkyl group or an aryl group; and n is 1 or 2, and when n is 2, one of R_1 and R_4 represents an alkylene group or an arylene group and the compound is a dimer.

4,163,672

PHOTOSENSITIVE COMPOSITION

Paul Stahlhofen, Wiesbaden, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

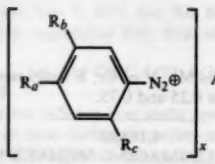
Filed Sep. 9, 1977, Ser. No. 831,819

Claims priority, application Fed. Rep. of Germany, Sep. 13, 1976, 2641099

Int. Cl.[2] G03C *1/52, 1/68*

U.S. Cl. 96—91 D **7 Claims**

1. A photosensitive composition comprising an ester or an amide of an o-naphthoquinone diazide sulfonic or carboxylic acid and, based upon the amount of this compound, about 1 to 50 percent by weight of an organic dye capable of salt formation and being selected from the group consisting of a triphenylmethane, azine, or anthraquinone dye, and about 5 to 75 percent by weight of a photosensitive halogen-containing diazonium salt which releases acid upon exposure to light and having the general formula I



in which

R_a is selected from the group consisting of hydrogen and halogen atoms, alkyl, alkoxy, aryl, arylmercapto, aryloxy, arylamino and benzoylamino groups,

R_b and R_c are selected from the group consisting of hydrogen atoms, alkyl, alkoxy, aryloxy, alkylmercapto and arylmercapto groups,

A is selected from the group consisting of PF_6, BF_4, AsF_6, $SbCl_6$, $SnCl_6$, $BiCl_5$, $ZnCl_4$ and SbF_5, and
x is 1 or 2,
with R_a and R_c simultaneously not being hydrogen.

4,163,673

FURNITURE POLISH EMULSION

Roberta S. Dechert, Mequon, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.

Filed Sep. 6, 1977, Ser. No. 830,935
Int. Cl.[2] C09G *1/04, 1/08, 1/10, 1/12*
U.S. Cl. 106—11 16 Claims

1. A surface-treating composition for furniture comprising a water-in-oil emulsion having:
from about 0.1–10% (by weight of the composition excluding any propellants) of a film-forming organic polysiloxane;
from 0 to about 5% of a surface-coating agent selected from the group consisting of film-forming wax and film-forming resin and combinations thereof;
from 0 to about 20% of a non-drying oil;
about 10–70% of a hydrocarbon solvent substantially the entire amount of which has a kauri-butanol value within the range of about 20–50 and boils within the range of about 80–200° C.;
about 0.05–3% of a cationic emulsifier which is soluble in said hydrocarbon solvent but insoluble and dispersible in water and has an HLB value of less than about 10;
from 0 to about 5% of a nonionic emulsifier at least in an amount sufficient to stabilize the emulsion; and
at least about 20% water, said hydrocarbon solvent, water, film-forming materials and cationic emulsifier being selected in an amount to provide both high gloss properties and good cleaning of oil-borne deposits.

4,163,674

PROCESS FOR MAKING A SYNTHETIC LIQUID ABSORBENT AND PRODUCTS RESULTING THEREFROM

Karl Been, Zuid, Netherlands, assignor to Oil-Dri Corporation of America, Chicago, Ill.

Division of Ser. No. 683,090, May 4, 1976. This application Apr. 1, 1977, Ser. No. 783,792
Int. Cl.[2] C09K *3/22*
U.S. Cl. 106—15.05 4 Claims

1. Synthetic liquid absorbent material in a granule form and having absorbent properties substantially equivalent to those of absorbent clay granules, said synthetic granules adapted to be used for any one of different liquid absorption purposes including that as an oil and grease absorbent on floors or the like, that as an absorbent in toilet boxes for household pets, that as an absorbent to carry a chemical to be used as an insecticide, or herbicide, or fungicide for agriculture purposes, and that as a ground cover or a conditioner, said material comprising gypsum granules manufactured by crushing a combination of set and hardened materials derived from a mixture containing gypsum plaster and water in an amount of about 15 weight percent water and about 85 weight percent plaster to about 50 weight percent water and about 50 weight percent plaster to provide hardened granules having a bulk density of about 26.4 to about 51.8 lbs./ft^3, water absorption of about 19 percent to about 88 percent, and oil absorption of about 34 percent to about 74 percent.

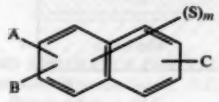
4,163,675

AQUEOUS INK COMPOSITION FOR WRITING INSTRUMENTS

Katsumi Hirano, Kuwana; Takeshi Teranishi, Nagoya; Kunio Kosaki, Nagoya, and Kazuhiko Honda, Nagoya, all of Japan, assignors to Pilot Ink Co., Ltd., Nagoya, Japan

Filed Jun. 30, 1978, Ser. No. 921,151
Claims priority, application Japan, Jun. 30, 1977, 52-78188
Int. Cl.[2] C09D *11/16, 11/18*
U.S. Cl. 106—22 8 Claims

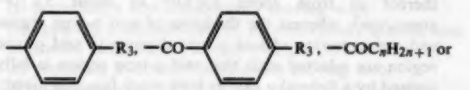
1. An aqueous ink composition for writing instruments consisting essentially of about 1 to about 15% by weight of a water-soluble dye, about 75 to about 99% by weight of an aqueous solvent of which at least about 50% by weight is water, and about 0.1 to about 10% by weight of a naphthalene derivative of the general formula (I):

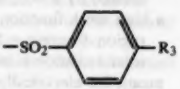


(I)

wherein S represents —SO_3M or —COOM in which M represents H, an alkali metal atom or NH_4; m is 1, 2, 3, or 4; and A, B and C, which may be the same or different, each represents —H, —OR_1,

—NO, —NO_2 or —N≡N$^+$ in which R_1 and R_2, which may be the same or different, each represents —H, —C_nH_{2n+1},





in which R_3 represents —H, —C_nH_{2n+1}, —NO_2, —NH_2, —OH or —COOH, and n is a number of 1 to 9.

4,163,676

ETHANOL-MODIFIED LECITHIN COOKWARE SPRAY COMPOSITION

Kurt S. Konigsbacher, Stamford, Conn., assignor to Blue Cross Laboratories, N. Hollywood, Calif.

Filed Apr. 3, 1978, Ser. No. 892,488
Int. Cl.[2] C08L *91/00*
U.S. Cl. 106—243 11 Claims

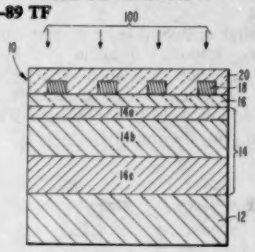
1. A pump dispensable lecithin-based pan spray composition consisting essentially of 2.5 to 65 parts of lecithin and the balance an essentially anhydrous vehicle free of mineral oil, providing a pump sprayable consistency in the composition and consisting essentially of 2.5 to 25 parts of monohydric alcohol having 2 to 3 carbon atoms and 10 to 95 parts of edible vegetable oil, per 100 parts by weight of the composition.

4,163,677

SCHOTTKY BARRIER AMORPHOUS SILICON SOLAR CELL WITH THIN DOPED REGION ADJACENT METAL SCHOTTKY BARRIER

David E. Carlson, Yardley, Pa., and Christopher R. Wronski, Princeton, N.J., assignors to RCA Corporation, New York, N.Y.

Filed Apr. 28, 1978, Ser. No. 901,256
Int. Cl.[2] H01L 31/06
U.S. Cl. 136—89 TF 12 Claims



1. A Schottky barrier amorphous silicon solar cell:
a substrate which is electrically conductive;
a body of hydrogenated amorphous silicon having three regions of hydrogenated amorphous silicon of differing conductivity type wherein a first region of n^+-type hydrogenated amorphous silicon electrically contacts said substrate, a second region of intrinsic hydrogenated amorphous silicon contiguous to said first region and a third region of p-type hydrogenated amorphous silicon contiguous to said second region said third region having a thickness of from about 50 to about 100 angstroms and a p-type doping concentration incorporated during the deposition thereof of from about 5×10^{18} to about 5×10^{20} atoms/cm^3, wherein the thickness of said p-type region and concentration of said p-type dopants in said p-type region are selected such that said p-type region is fully ionized by a Schottky barrier high work function metal;
a high work function metal layer contiguous to said p-type region forming a Schottky barrier therewith on which solar radiation is incident; and
means for electrically contacting said Schottky barrier.

4,163,678

SOLAR CELL WITH IMPROVED N-REGION CONTACT AND METHOD OF FORMING THE SAME

Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of, and Kenneth R. Bube, Skillman, N.J.

Filed Jun. 30, 1978, Ser. No. 920,879
Int. Cl.[2] H01L 31/06
U.S. Cl. 136—89 CC 5 Claims

1. In a solar cell characterized by a semiconductor wafer of a P-type material having an N-type region including a group V dopant for establishing a P-N junction, an improved contact affixed to the N-type region at an outer surface of the cell comprising a sintered mixture of silver and metaphosphate.

4,163,679

ALUMINUM TREATMENT WITH ALKALINE SOLUTION AND TANNIN

Yoshio Nagae, and Takashi Utsumi, both of Yokohama, Japan, assignors to Oxy Metal Industries Corporation, Warren, Mich.

Filed Mar. 30, 1978, Ser. No. 891,971
Claims priority, application Japan, Mar. 31, 1977, 52-35498
Int. Cl.[2] C23F 7/00, 7/06
U.S. Cl. 148—6.27 3 Claims

1. A chromium-free process for imparting corrosion resistance to a surface of aluminum and its alloys, comprising:
(a) contacting the surface with an aqueous alkaline solution having a pH value of at least 10 and comprising complexed iron ions in a concentration of at least 0.01 g/l iron;
(b) rinsing the surface with water; and
(c) contacting the surface with an aqueous acidic solution containing at least 0.01 g/l of an organic tannin.

4,163,680

PROCESS FOR CARBONITRIDING STEEL AND CAST IRON ARTICLES

Sergei A. Syrchikov, ulitsa Sverdlova, 180, kv. 33, and Vladimir L. Tulsky, Moskovsky prospekt, 96, kv. 143, both of Tolyatti Kuibyshevskoi oblasti, U.S.S.R.

Filed Nov. 17, 1976, Ser. No. 742,630
Claims priority, application U.S.S.R., Nov. 21, 1975, 2191966[I]
Int. Cl.[2] C21D 1/48
U.S. Cl. 148—16.5 5 Claims

1. A process for carbonitriding articles of steel and cast iron by saturating said articles with a carbonitriding medium of vaporous ammonium carbamate at a temperature of 550° to 650° C., said vaporous ammonium carbamate being produced by evaporating crystalline ammonium carbamate or by reacting ammonia with carbon dioxide at a temperature of 20° to 150° C., the stoichiometric ratio between ammonia and carbon dioxide being 2:1, and wherein the ammonium carbamate carbonitriding reaction occurs as follows:

$$NH_4O(CO)NH_2+9Fe=2Fe_3N+Fe_3C+2\text{-}H_2O+H_2.$$

4,163,681

DESENSITIZED EXPLOSIVES AND CASTABLE THERMALLY STABLE HIGH ENERGY EXPLOSIVE COMPOSITIONS THEREFROM

Julius Rothenstein, Citrus Heights, and Samuel Goldhagen, Sacramento, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 15, 1970, Ser. No. 28,991
Int. Cl.[2] C06B 45/22
U.S. Cl. 149—11 14 Claims

1. A novel desensitized explosive comprising a normally sensitive solid explosive material coated with an effective desensitizing amount of a phlegmatizing agent which contains functional groups reactive with at least one ingredient conventionally used in forming a thermally stable, crosslinked solid composite explosive, and which is polyvinyl alcohol.

2. A novel desensitized explosive comprising a normally sensitive solid explosive material selected from the group consisting of RDX, HMX, perchlorates and mixtures thereof coated with an effective desentizing amount of a phlegmatizing agent which contains functional groups reactive with at least one ingredient conventionally used in forming a thermally stable, crosslinked solid composite explosive, and which is selected from the group consisting of a polyoxyethylene glycol, polycarboxylic acids, glycerol monoricinoleate, polyvinyl alcohol and mixtures thereof.

4,163,682

METHOD FOR DISPOSING OF RED PHOSPHORUS COMPOSITION

Francis E. Montgomery, Bloomfield; James E. Short, Jr., Switz City, and William J. Weaver, Washington, all of Ind., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 5, 1978, Ser. No. 948,737
Int. Cl.[2] C06B *25/02*
U.S. Cl. 149—108.4 8 Claims

1. A method for disposing of pyrotechnic material comprised of at least fifty percent, by weight, of red phosphorus comprising,

burning said pyrotechnic material in a first enclosed chamber and passing the products of combustion into a second enclosed chamber,

then burning said products of combustion in said second enclosed chamber,

then spraying the products of combustion from the second burning with water to produce phosphoric acid,

then collecting said phosphoric acid,

then spraying the ashes in said first enclosed chamber with water to produce phosphine, and

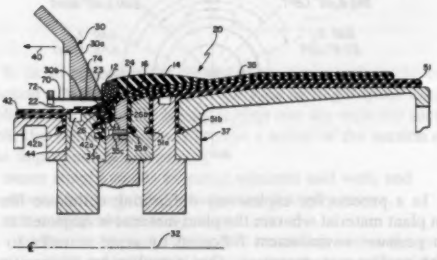
then burning said phosphine in said first enclosed chamber.

4,163,683

FORMING A TIRE BEAD ASSEMBLY

Robert A. Lammlein, Jr., Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Dec. 27, 1977, Ser. No. 864,952
Int. Cl.[2] B29H *17/32*
U.S. Cl. 156—136 4 Claims



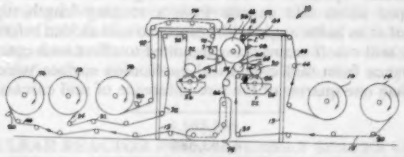
2. A method of making a tire bead assembly which assembly includes an inextensible bead core, an apex, and a gum tie strip, said method comprising wrapping a gum tie strip of predetermined width circumferentially about support means, said support means being rotatable about an axis and comprising a cylindrical surface having a diameter less than the inside diameter of said bead core, said cylindrical surface being provided by an inflatable bladder, a conical surface having a tie strip supporting portion greater in diameter than the inside diameter of said bead core and sloping radially outwardly of said axis and axially away from said cylindrical surface, said conical surface being provided by an inflatable bag, and a third surface extending slopingly from said cylindrical surface to said conical surface at said portion, said third surface being provided by a non-inflatable elastically deformable circumferential member of triangular cross-section, said member having a fabric web extending therefrom and secured radially inwardly of and between the adjacent ends of said cylindrical surface and said conical surface, the width of said gum tie strip being sufficient to span said third surface and overlie portions of said conical and of said cylindrical surface respectively adjacent said third surface, urging said bead core coaxially of said support means to coaxial contact with said gum tie strip and sufficiently farther significantly to indent circumferentially and axially said third surface thereby to conform said surface and said gum tie strip in endless circumferential relation partially to wrap said gum tie strip about said bead core free of wrinkles or air pockets therebetween, wrapping said apex circumferentially about said gum tie strip on said conical surface such that the bead core engaging portion of the apex lies in a plane perpendicular to said axis and closely adjacent said bead core, inflating said bag and urging it axially toward said bead core thereby to rotate the major axial dimension of said apex strip and a first portion of said gum tie strip angularly about said bead core from an initial position on said conical surface to an angular position of at least 90 degrees with respect to said initial position to cohere said bead engaging portion of said apex and the radially outward surface of said bead core with said first part of the width of said gum tie strip overlying and cohering on said bead core and said apex, then inflating said bladder thereby to expand a portion of said non-inflatable member to wrap the other part of the width of said gum tie strip to overlie and cohere with said bead core and said apex, then removing said bead assembly from said support means for insertion in a tire.

4,163,684

METHOD AND APPARATUS FOR STRIP LAMINATING

John M. Kartanson, Winston-Salem, N.C., assignor to RJR Archer, Inc., Winston-Salem, N.C.

Filed Jan. 27, 1978, Ser. No. 873,028
Int. Cl.[2] B32B *31/00*
U.S. Cl. 156—259 10 Claims



1. A method for laminating longitudinal strips to a backing web comprising the steps of:

(a) providing a first continuously moving web;

(b) applying a selected pattern of transversely spaced, continuous, longitudinal, adhesive stripes on said first web;

(c) providing a second continuously moving web;

(d) moving said second web into contact with an anvil;

(e) severing said second web, longitudinal to its direction of movement, into a plurality of continuous strips;

(f) maintaining said plurality of continuous strips in contact with said anvil; and

(g) contacting the continuous strips while on said anvil with said first web so that selected strips adhere to the continuous adhesive stripes on said first web to form a first composite web.

4,163,685

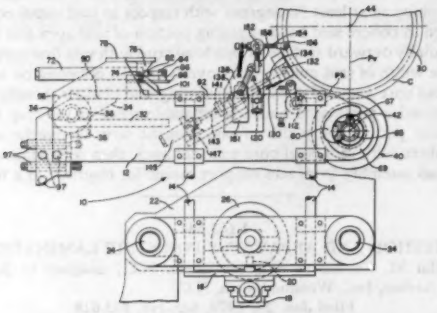
APPLICATION OF SIDEWALL TO A TIRE CARCASS

Donald C. Kubinski, Wadsworth, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Mar. 23, 1978, Ser. No. 889,457
Int. Cl.[2] B29H *17/18*
U.S. Cl. 156—405 R 6 Claims

1. A device for applying uncured gum sidewall directly on a tire carcass supported on a building drum rotatable about a drum axis, the device comprising a frame, roll means providing a cylindrical application surface rotatable about a roll axis parallel to said drum axis in response to rotation of said drum, said cylindrical application surface having a first axial portion provided by a plurality of annular discs spaced coaxially to provide annular slots therebetween and a second axial portion coaxially adjacent said first portion provided by a plurality of annular discs of equal diameter and of lesser axial thickness disposed in side-by-side contact coaxially of said roll axis, said drum axis and said roll axis defining a first reference plane, carrier means mounted on said frame for reciprocable movement parallel to a second reference plane which is perpendicu-

lar to said first reference plane and tangent to said cylindrical application surface, and air cylinder means mounted on said frame and connected to said carrier means to effect said reciprocating movement, said carrier means including a sub-frame having a sidewall supporting surface parallel to said second reference plane, at least part of said supporting surface comprising a plurality of fingers respectively aligned parallel to



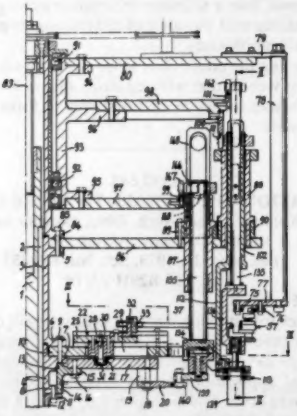
said direction of reciprocating movement and respectively aligned with said annular slots, and cutoff means mounted on said frame operable to cut off a length of sidewall being wrapped about said carcass from a running length supply thereof at an acute angle with respect to said second reference plane, said cutoff means being mounted to effect such cutoff at a distance from said cylindrical application surface which is less than one-quarter of the circumference of said carcass.

4,163,686

LABELLING MACHINE FOR APPLYING A LABEL, IN PARTICULAR A SEALING BAND, TO A CONTAINER

Roberto Risi, Casalecchio Di Reno, Italy, assignor to MA.CO S.a.s. di Saso Vittorio & C., Casalecchio Di Reno, Italy

Filed Jun. 2, 1977, Ser. No. 802,931
Claims priority, application Italy, Jun. 11, 1976, 3462 A/76
Int. Cl.[2] B65C *3/20*
U.S. Cl. 156—492 **2 Claims**



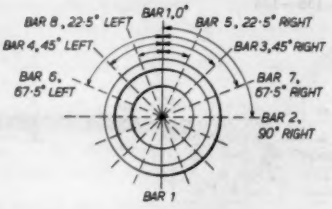
1. A labelling machine for applying a sealing label on the top of a bottle comprising a carousel rotating about a vertical axis and having pivotal bottle supporting plates, a plurality of clamp members mounted on said carousel and adapted to grip the opposite ends of a label delivered from a magazine, frame members supported on said carousel and each defining a cylindrical seat diametrically slotted to form an opening for the passage of a label, means for actuating said frame members so as to bring said seats in engagement on the bottle tops, means for actuating said clamp members between a label pick up position and a position at which said label is placed on the top of the bottle, vertically movable press members controlled so as to penetrate said opening to clamp the label on the bottle top and to fold down the opposite ends of the label on the bottle neck, wherein each clamp member comprises a lever pivoted about a horizontal axis tangential with respect to the carousel axis of rotation, said lever supporting pivotally a pin carrying a finger, said pin being subjected to elastic means tending to hold said finger in contact with an abutment or detent in said lever such as to form a clamp and to cam means controlling the rotation of said pin in opposition to said elastic means for opening the clamp, said lever being controlled through a tie bar by a slide guided radially on said carousel and connected to cam means adapted to cause the lever to rotate from a label pick up position to a position at which said label is placed on top of a container.

4,163,687

METHOD AND APPARATUS FOR EXPLOSIVELY DEFIBRATING CELLULOSIC FIBER

Heikki Mamers, Seaford, and John E. Rowney, St. Albans, both of Australia, assignors to Commonwealth Scientific and Industrial Research Organization, Campbell, Australia

Filed Apr. 24, 1978, Ser. No. 899,148
Claims priority, application Australia, Apr. 27, 1977, PC9894
Int. Cl.[2] D21B *1/36*
U.S. Cl. 162—21 **5 Claims**



1. In a process for explosively defibrating cellulosic fibre from plant material wherein the plant material is subjected to a high pressure environment followed by rapid transfer to a lower pressure environment, the improvement comprising passing the material from the high to the low pressure environment by way of a discharge nozzle across which a plurality of bars spanning diametrically across the nozzle having rounded leading edges facing in the direction of flow are arranged in such a manner as to cause the plant material passing therethrough to be folded over, successive bars thereby subjecting the folded plant material to shear and tensile forces generated by the concomitant passage of highly turbulent fluids causing the material to be successively pulled apart into individual fibres and fibre bundles wherein said bars are disposed at varying angles relative to each other along the longitudinal axis of the nozzle and the minimum number of bars and their arrangement in the nozzle is such that when the nozzle is viewed in the direction of passage of the plant material no clear passage exists in the nozzle through which a fragment of the plant material may traverse without being folded over a bar.

2. A discharge nozzle having a passageway through which cellulosic material may be explosively defibrated from a high pressure pulping digester to a lower pressure reservoir, said nozzle having a plurality of bars spanning diametrically across the nozzle having rounded leading edges facing the direction of flow extending across said passageway at varying locations along the longitudinal axis thereof so as to provide a series of the bars which are arranged so that any passing plant material is successively folded over the bars and pulled apart into individual fibres and small fibre bundles wherein the angles at

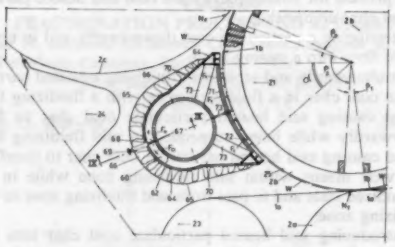
which the axis of the bars are set relative to each other are randomized and the minimum number of bars and their arrangement in said passageway is such that when the passageway is viewed in the direction of passage of the plant material no clear passage exists in the passageway through which a fragment of the plant material may traverse without being folded over bar.

4,163,688

APPARATUS FOR DEWATERING IN A PAPER MACHINE

Matti Kankaanpää, Espoo, Finland, assignor to Valmet Oy, Helsinki, Finland

Continuation-in-part of Ser. No. 310,805, Nov. 30, 1972, abandoned. This application Apr. 25, 1977, Ser. No. 790,421
Claims priority, application Finland, May 18, 1976, 761398
Int. Cl.[2] D21F *3/02*
U.S. Cl. 162—359 **3 Claims**



1. In an apparatus for dewatering a paper web in the press section of a paper machine of the type having a felted suction roll, at least one roll forming at least one nip with the suction roll, the web being passed around a sector of the suction roll, the improvement comprising

steam supply means mounted adjacent said web, and

means for conducting steam to said supply means,

said supply means comprising

at least one steam supply box extending across the entire width of said web adjacent the suction roll, said box having an interior space and an open side opening toward said suction roll and conforming to the curvature of said roll over a substantial sector thereof to define a flow path for treatment steam onto said sector;

an inner pipe in said steam box;

a shell portion; and

means for supporting said shell portion around said inner pipe;

said shell portion comprising a concave wall adjacent said suction roll, said wall having means defining openings therethrough for the passage of steam,

an inner wall defining, with said concave wall, a steam supply space,

an outer wall spaced from said inner wall,

thermal insulating means between said inner and outer walls, and

means defining openings through a wall of said pipe for directing steam into said steam supply space in a direction away from the web,

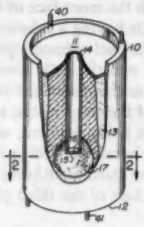
said supply box further comprising steam quantity adjustment means operatively associated with said openings through said wall of said pipe for controlling the flow of steam into said space, a plurality of said openings and associated adjustment means being disposed in side-by-side relationship along said pipe.

4,163,689

VENTED NUCLEAR FUEL ELEMENT

Leonard N. Grossman, Livermore, and Alexis I. Kaznoff, Castro Valley, both of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Dec. 3, 1965, Ser. No. 512,823
Int. Cl.[2] G21C *3/02*
U.S. Cl. 176—68 **5 Claims**



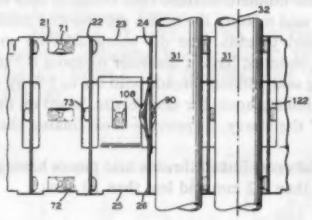
1. A vented nuclear fuel element for use in a nuclear reactor, comprising a fissile fuel body, means defining a cladding surrounding and containing said fissile fuel body, a conduit penetrating said fissile fuel body and affixed and sealed to said cladding and having one end opening proximate the center of gravity of said fissile fuel body with distal end of said conduit opening outside said cladding for conduction of volatile and gaseous fission products away from said fissile fuel body.

4,163,690

NUCLEAR REACTOR FUEL ASSEMBLY SPACER GRID

Felix S. Jabsen, Lynchburg, Va., assignor to The Babcock & Wilcox Company, New York, N.Y.

Filed Jan. 7, 1977, Ser. No. 757,723
Int. Cl.[2] G21C *3/30*
U.S. Cl. 176—78 **8 Claims**



1. A nuclear reactor fuel assembly spacer grid for supporting and spacing a plurality of elongated fuel elements with their longitudinal axes in parallel comprising: at least two generally rectangular first plates, second plates, and a plurality of substantially flat rectangular third plates, each having lengthwise edges disposed transversely with respect to the longitudinal axes of the fuel elements and widthwise edges disposed generally parallel to the longitudinal axes of the fuel elements, and oppositely disposed faces bound perimetrically by said lengthwise and widthwise edges; a peripheral band circumscribing the spacer grid; said peripheral band having an inner face and an outer face; said lengthwise edges of said first and second plates transversely cut by slots each along a respective lengthwise edge thereof for mutually interlocking said first and second plates as a pair with said third plates; one of said first and one of said second plates being generally disposed in longitudinally spaced and inverted relation with respect to each other so that said slots on said respective first and second plates are oriented in opposite directions to form a first set of paired

plates each having spaced cantilevered panels traversing the longitudinal space such that a portion of each panel is in transverse contact with the opposing plate of the pair; other first and second plates being relatively longidudinally spaced and inverted to form a second set of paired plates similar to said first set of paired plates; said first and second sets of paired plates being further disposed to perpendicularly intersect each other set and the third plates to mutually interlock therewith; said widthwise edges of the first, second, and third plates being in communication with the inner face of the peripheral band to form a plurality of cells having a substantially open cross-section through which the fuel elements protrude; a plurality of protrusions extending into the cells from one face of the first and second plates, from the inner face of the peripheral band, and from both faces of the third plates; said protrusions of the first and second plates being resilient; said protrusions of the inner face of the prripheral band being rigid; and said protrusions on one face of the third plate being rigid and the protrusions on the opposite face of the third plates being resilient.

4,163,691

INSOLUBLE ENZYMATICALLY ACTIVE PARTICLES

Francis Devos; Patrick Leroy, and Michel Huchette, all of Lestrem, France, assignors to Roquette Freres, Lestrem, France

Filed Jun. 3, 1977, Ser. No. 803,244
Claims priority, application France, Jun. 4, 1976, 76 17155
Int. Cl.[2] C07G *7/02;* C12K *1/00*
U.S. Cl. 435—174 **9 Claims**

1. A process for manufacturing insoluble enzymatically active particles comprising, successively:

forming an intimate mixture of a slurry of microbial cells containing glucose-isomerase as an endocellular enzyme at a temperature of less than about 55° C. and 3 to 20% by weight of gelatin as a jellifying agent,

dividing the intimate mixture thus obtained into threads by passing said mixture through a die and into cold water to jellify said threads, said die being selected so that the threads obtained have a diameter of about 0.2 to 5 mm,

contacting said jellified threads with 0.5 to 5% by weight of a cross-linking agent for said gelatin, based on the starting mass of the slurry, to provide cross-linking thereof, and then

cutting said cross-linked threads into pieces having a length greater than 0.2 mm and less than 10 mm.

4,163,692

LOW PHOSPHATE GROWTH OF FUNGAL MYCELIA

Richard A. Yates, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 25, 1977, Ser. No. 790,855
Int. Cl.[2] C12B *1/08;* C12D *13/06*
U.S. Cl. 435—254 **7 Claims**

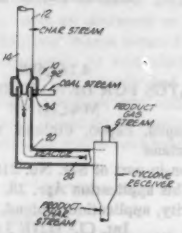
1. A process comprising growing an edible strain of Fusarium on a carbohydrate substrate under aerobic conditions in a culture medium containing essential growth-promoting nutrient substances to produce a mycelial mass, wherein the phosphate present in the medium is maintained at from the amount which is growth limiting up to 5 millimolar above the amount which is growth limiting, harvesting at least a portion of the grown fungal mycelial mass and reducing the ribonucleic acid content of the harvested fungal mycelial mass by means of enzyme activation.

4,163,693

FLUIDIZING A MIXTURE OF PARTICULATE COAL AND CHAR

Norman W. Green, Pomona, Calif., assignor to Occidental Petroleum Corporation, Los Angeles, Calif.

Continuation of Ser. No. 449,073, Mar. 7, 1974, abandoned. This application Nov. 20, 1975, Ser. No. 633,898
Int. Cl.[2] C10B *1/00*
U.S. Cl. 201—22 **11 Claims**



1. A process for mixing particulate coal and heated particulate coal char comprising:

a. introducing a particulate coal downwardly and in turbulent flow into a mixing zone;

b. simultaneously and separately fluidizing a heated particulate coal char in a fluidizing zone with a fluidizing fluid and causing said heated particulate coal char to flow upwardly while being suspended in said fluidizing fluid and causing said heated particulate coal char to overflow a weir means within said fluidizing zone while in the fluidized state and to pass from said fluidizing zone to said mixing zone;

c. introducing said heated particulate coal char into said mixing zone substantially completely around said particulate coal as said particulate coal is first introduced into said mixing zone; and

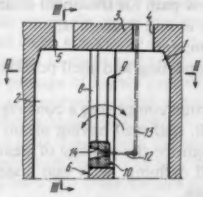
d. mixing said particulate coal and said heated particulate coal char in said mixing zone.

4,163,694

HEATING WALL FOR COKE OVENS

Alexandr N. Minasov, ulitsa Ivanova, 12/16, kv. 59; Evgeny P. Likhogub, ulitsa Slinka, 2, kv. 11, and Stanislav S. Sergeev, ulitsa Kosmonavtov, 3, kv. 114, all of, Kharkov, U.S.S.R.

Filed Feb. 27, 1978, Ser. No. 882,207
Int. Cl.[2] C10B *5/04*
U.S. Cl. 202—139 **3 Claims**



1. A heating wall for a coke oven with horizontal coking chambers comprising: vertical heating flues arranged in pairs; a partition separating the heating flues with each pair having an upper portion adjacent the top of each pair of heating flues; a flow port in the upper portion of said partition for combustion products to flow from one of said vertical flues into the other; vertical slot-like guides on opposite sides of said flow port; a slide gate whose vertical extent is less than that of the flow port and which is provided with projections to fit in a sliding manner into said slot-like guides; each slot-like guide having an upper portion on the same side in the form of a

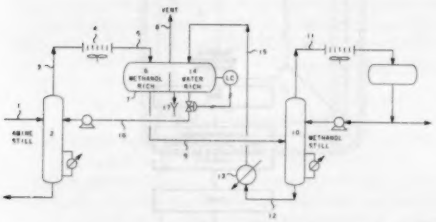
stepped recess to enable receipt of said projections; said slide gate having a center of gravity being shifted with respect to the central longitudinal axis of said projections in a direction opposite to said stepped recesses, the vertical extent of said stepped recesses exceeding that of the slide gate projections to provide for gravity swinging and fixing of said slide gate in an uppermost position in the flow port in order to change the vertical position of said flow port without substantially changing the area of the flow port, in said uppermost position said slider plate being obliquely disposed with lower and upper portions of said projections respectively contacting said stepped recesses and said slot-like guides; means in said slide gate for receiving a hook therein to permit displacement of said slide gate in said flow port; and means in each heating flue for inserting a hook therethrough to permit slide plate movement by said hook.

4,163,695

FRACTIONATION PROCESS AND APPARATUS

Paul H. Archerd, Oklahoma City, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 1, 1977, Ser. No. 829,751
Int. Cl.[2] B01D 3/14
U.S. Cl. 203—18 **14 Claims**



1. A method for accumulating and distributing the fluid streams for two fractionators comprising:

(a) feeding at least partially condensed overhead from a first fractionation column into a first chamber within an enclosed vessel divided internally into a first and second chamber by a baffle wherein said baffle allows overflowing from one chamber to the other;

(b) passing that amount of liquid in the first chamber to the second chamber which accumulates in said first chamber in an amount sufficient to overflow into the second chamber;

(c) passing liquid from said first chamber of said enclosed vessel as feed to a second fractionator;

(d) feeding the bottoms liquid from the second fractionator into the second chamber of the enclosed vessel in (a);

(e) passing liquid from said second chamber of enclosed vessel to said first fractionator of (a) as reflux; and

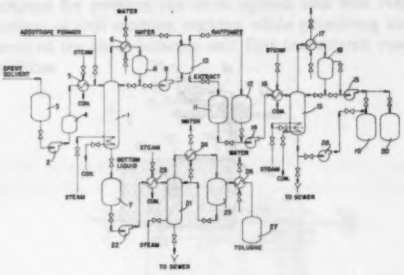
(f) in the event that said second fractionator is shut down and the first fractionator continues operation, the overhead from the first fractionator accumulates in the first chamber of the enclosed vessel, overflows into the second chamber of the enclosed vessel, and is then returned to said first fractionator as reflux.

4,163,696

DISTILLATION PROCESS FOR RECOVERY OF METHYL ISOBUTYL KETONE

Wang-Mo Wong, Matteson, Ill., assignor to Arthur G. McKee & Company, Independence, Ohio

Filed Jun. 7, 1978, Ser. No. 913,530
Int. Cl.[2] B01D 3/36; C07C 49/06
U.S. Cl. 203—44 **12 Claims**



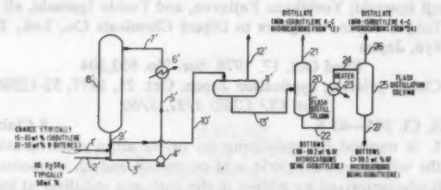
1. In a distillation process for separating a mixture of methyl isobutyl ketone (MIBK) and toluene, the improvement which comprises adding methanol to the mixture prior to distillation to form an azeotrope of toluene and methanol and then distilling the mixture to separate and recover one fraction of the MIBK and another fraction of said azeotrope.

4,163,697

PROCESS FOR OBTAINING ISOBUTYLENE OF A PURITY HIGHER THAN 99.5 WEIGHT PERCENT

Jean-Pierre Michaux, Chatou, France, assignor to Compagnie Francaise de Raffinage, France

Filed Feb. 17, 1977, Ser. No. 769,738
Claims priority, application France, Feb. 27, 1976, 76 05649
Int. Cl.[2] B01D 1/14, 3/06; C07C 7/04, 7/10
U.S. Cl. 203—49 **20 Claims**



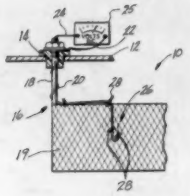
1. In a process for recovering isobutylene contained in a mixture of hydrocarbons having four carbon atoms, by selective liquid-liquid extraction with an aqueous solution of sulfuric acid of a concentration of about 50 wt. % to give an isobutylene-rich sulfuric acid extract which is then subjected to a flash distillation in a zone to further enrich the isobutylene content of said extract, the improvement for obtaining isobutylene of a purity of greater than 99.5 wt. % comprising removing the bottoms from said flash distillation zone, heating said separated bottoms to an effective distillation temperature and in a separate zone subjecting the heated bottoms to a further independent flashing step.

4,163,698

IN SITU REFERENCE ELECTRODE FOR DIAPHRAGM CELLS

Han C. Kuo, Cleveland; George W. Geren, Georgetown; Thomas E. Corvin, and Byung K. Ahn, both of Cleveland, all of Tenn., assignors to Olin Corporation, New Haven, Conn.

Filed May 22, 1978, Ser. No. 908,434
Int. Cl.[2] G01N *27/30*
U.S. Cl. 204—1 T **17 Claims**



1. A method for directly measuring the overvoltage of a gas producing electrode of a chlor-alkali diaphragm cell during electrolysis and generation of gas, which comprises the step of positioning an exposed metal tip of a reference electrode, immersed in the same electrolyte as said gas producing electrode, at a location of from about 0.2 to about 1.0 mm away from said gas producing electrode within a stream of gas produced by said gas producing electrode during electrolysis and measuring the potential difference between said reference electrode and said gas producing electrode during electrolysis and generation of gas.

4,163,699

Patent Not Issued For This Number

4,163,700

METHOD FOR STABILIZING TIN OR TIN ALLOY ELECTROPLATING BATHS

Shuji Igarashi; Yoshikazu Fujisawa, and Toshio Igarashi, all of Tokyo, Japan, assignors to Dipsol Chemicals Co., Ltd., Tokyo, Japan

Filed Oct. 17, 1978, Ser. No. 952,204
Claims priority, application Japan, Oct. 21, 1977, 52-125865
Int. Cl.[2] C25D *3/32, 3/60*
U.S. Cl. 204—43 S **8 Claims**

1. A method for stabilizing tin or tin alloy electroplating baths which contain citric acid or its salt and an ammonium salt, characterized by adding in the bath as a stabilizer at least one saturated hydrocarboxylic acid or its salt other than citric acid and citrate and/or at least one saturated dibasic carboxylic acid or its salt.

4,163,701

METHOD OF ELECTROCHEMICAL MACHINING OF POLYPHASE ALLOYS

Charles Schepacz, Firminy, France, assignor to Centre Technique des Industries Mecaniques, Senlis, France

Filed Feb. 13, 1978, Ser. No. 877,110
Claims priority, application France, Feb. 24, 1977, 77 05448
Int. Cl.[2] C25F *3/00, 3/08*
U.S. Cl. 204—129.75 **7 Claims**

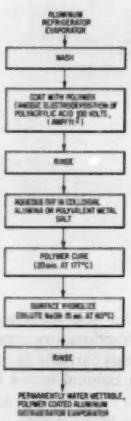
1. A method of electrochemically machining two-phase alloys comprising at least one metallic carbide phase and one metallic phase, comprising the step of passing an electric current between an inert tool-electrode and the alloy to be machined to the shape of the tool-electrode within an electrolyte containing ammonium fluoride and/or ammonium fluroborate and having a pH value within the range of 6 to 8.

4,163,702

PROCESS FOR RENDERING SURFACES PERMANENTLY WATER WETTABLE AND NOVEL PRODUCT THUS-PRODUCED

Milton E. Rickert, Jr., Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Mar. 29, 1978, Ser. No. 891,438
Int. Cl.[2] C23D *13/00;* C25D *13/06;* F25B *39/02*
U.S. Cl. 204—181 T **36 Claims**



1. A process for rendering permanently water wettable a surface of an article of manufacture which normally is not water wettable or which loses its water wettability upon exposure to air or water, which comprises the steps of:

(a) coating the surface with a continuous film of the free acid form of a film forming acidic polymer which forms water soluble salts and which is curable to water insolubility, said film containing a curing agent for the polymer;

(b) contacting the thus-coated surface, under aqueous conditions which retain the polymer coating on the surface, with colloidal alumina or a water soluble salt of a polyvalent metal;

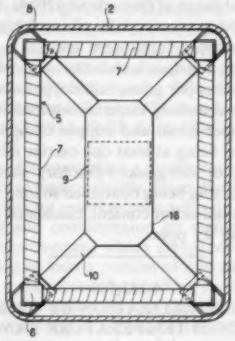
(c) curing the thus-contacted polymer on the substrate surface to water insolubility; and, if required to render the cured polymer coating water wettable, thereafter hydrolyzing substantially only the surface portion of the cured polymer.

4,163,703

METHOD OF COATING THE INSIDE SURFACE OF A HOLLOW BODY

Alain Gernez, Saint Jean de la Ruelle, France, assignor to Compagnie Europeenne pour l'Equipement Menager "CEPEM", Paris, France

Filed Jul. 31, 1978, Ser. No. 929,603
Claims priority, application France, Aug. 1, 1977, 77 23592
Int. Cl.[2] B01D *13/02*; C25B *11/00*; C25D *7/04, 13/14*
U.S. Cl. 204—181 R **12 Claims**



1. A method of coating the inside surface of a hollow body having a curved interior by means of an electric current established between the hollow body and an electrode inserted therein, said method comprising the steps of:

expanding the electrode after insertion into the hollow body to bring it closer to the interior angles of the inside surface of the hollow body, said electrode comprising a drainage electrode including a part of substantially tubular shape,

and wherein said method of coating further comprises the step of flowing fluid through said tubular shaped part during the application of electric current between said hollow body and said electrode.

4,163,704

APPARATUS FOR SELECTIVELY PLATING RECTANGULAR SHEET CONTINUOUSLY OR INTERMITTENTLY

Yasuyuki Murata, Kamakura, Japan, assignor to Electroplating Engineers of Japan, Ltd., Tokyo, Japan

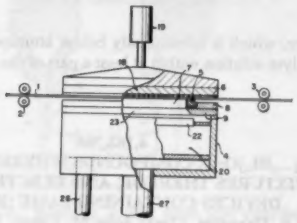
Division of Ser. No. 675,135, Apr. 8, 1976, Pat. No. 4,083,755. This application Nov. 14, 1977, Ser. No. 850,966
Claims priority, application Japan, Jun. 14, 1975, 50-80126
Int. Cl.[2] C25D *17/00*
U.S. Cl. 204—206 **8 Claims**

1. An apparatus for selectively plating a sheet, comprising:

a pair of inlet guide rollers and a pair of outlet pull rollers for moving the sheet;

a masking packing having a first contact surface adapted for contacting one surface of the sheet, said masking packing having opening means extending through said first contact surface, said opening means having the configuration of the plating deposit to be made on the sheet;

a pressure packing having a second contact surface adapted for contacting the second surface of the sheet, said pressure packing being disposed in opposing relationship to said first contact surface of said masking packing and adapted for pressing the sheet against said first contact surface of said masking packing while permitting movement of the sheet between said first and second contact surfaces;



a plating box associated with said masking packing and including nozzle means for directing one or more jets of plating solution into said opening means in said masking packing;

means for circulating and supplying plating solution to said nozzle means; and

a source of DC electroplating potential whose negative side is electrically connected to means adapted to contact the sheet and whose positive side is electrically connected to said nozzle means.

4,163,705

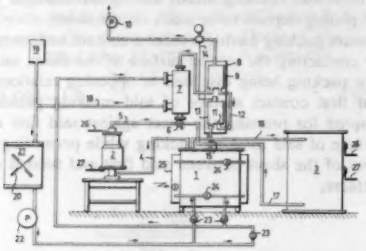
APPARATUS FOR CHEMICAL AND ELECTROCHEMICAL TREATMENT

Teuvo T. Korpi, Kaarelanti 97A, 00420 Helsinki, 42, Finland

Division of Ser. No. 684,122, May 6, 1976, abandoned. This application May 24, 1977, Ser. No. 800,148
Claims priority, application Finland, May 6, 1975, 751337
Int. Cl.[2] C25D *17/02*
U.S. Cl. 204—239 **16 Claims**

1. An electroplating apparatus for applying a protective metallic coating on the surface of an object, said apparatus comprising chamber means and liquid electrolyte solution in the chamber means, said chamber means including a process chamber which contains at least a part of said liquid electrolyte solution and in which said object may be submerged in the liquid electrolyte solution, and the apparatus further comprising means for leading an electric current to said object and to said solution, said process chamber being provided with means for effectively preventing atmospheric air from flowing

through said chamber, and a pneumatic pressure-reducing pump connected to the chamber means to maintain a reduced



pressure, which is substantially below atmospheric, above the electrolyte solution within at least a part of the chamber means.

4,163,706

$Bi_2[M_{2-x}Bi_x]O_{7-y}$ COMPOUNDS WHEREIN M IS RU, IR OR MIXTURES THEREOF, AND ELECTROCHEMICAL DEVICES CONTAINING SAME (BAT-24)

Harold S. Horowitz, Clark; John M. Longo, New Providence, and Joseph T. Lewandowski, Middlesex, all of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Dec. 2, 1977, Ser. No. 856,628

Int. Cl.[2] C25B *9/00, 11/04;* C01G *29/00;* H01B *1/08*

U.S. Cl. 204—242 **34 Claims**

1. A compound having the formula:

$$Bi_2[M_{2-x}Bi_x]O_{7-y}$$

wherein M is selected from the group consisting of Ru, Ir and mixtures thereof, wherein x is greater than or equal to about 0.1 and less than or equal to about 1.0 and wherein y is greater than or equal to zero and less than or equal to about 1.0.

4,163,707

ASPHALT CONVERSION

Frans Goudriaan, and Jakob van Klinken, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed May 15, 1978, Ser. No. 905,838

Claims priority, application Netherlands, May 18, 1977, 7705482

Int. Cl.[2] C10G *3/00*

U.S. Cl. 208—44 **7 Claims**

1. A process for catalytically hydroconverting asphalt which comprises: (a) contacting asphalt in a first reactor with a hydrogenated middle distillate, hydrogen and with a hydrogenation catalyst at an elevated temperature and pressure and under conditions effecting both hydroconversion of the asphalt and dehydrogenation of said middle distillate; (b) separating the product from said first reactor by fractionation distillation into at least one dehydrogenated distillate fraction having a lower hydrogen content than the hydrogenated middle distillate fraction feed to the first reactor, and a residue fraction having a sulphur content lower than said asphalt; (c) contacting said dehydrogenated middle distillate fraction from step (b) in a second reactor with hydrogen and a hydrotreating catalyst under hydrogenation conditions; (d) circulating at least part of the middle distillate fraction product from the second reactor, said product having a higher hydrogen content than the feed to the second reactor, as feed to said first reactor (e) circulating hydrogenation catalyst from said first reactor to said second reactor and from said second reactor to said first reactor, and (f) withdrawing the residue fraction from said first reactor.

4,163,708

PROCESS FOR THE REMOVAL OF THIOLS FROM HYDROCARBON OILS

Robert L. Jacobson, Pinole, and K. R. Gibson, El Cerrito, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation of Ser. No. 788,041, Apr. 15, 1977, abandoned, which is a continuation of Ser. No. 591,090, Jun. 27, 1975, abandoned. This application Apr. 3, 1978, Ser. No. 892,544

Int. Cl.[2] C10G *29/06, 23/00*

U.S. Cl. 208—89 **10 Claims**

1. In the production of a hydrocarbon reformate from a hydrocrackable hydrocarbon oil by steps, including hydrodesulfurizing said oil, subjecting the resulting hydrodesulfurized oil to ordinary hydrocracking conditions and reforming the resulting hydrocrackate under platinum catalyzed hydrocarbon reforming conditions, the improvement comprising producing an improved feed for said reforming by removing residual thiol sulfur from said hydrocrackate by contacting said hydrocrackate in the liquid phase with a thiol scavenger, said hydrocrackate having a total sulfur-containing impurity content, calculated as sulfur, in the range below 1000 ppm, including at least 0.2 ppm of thiol impurity, said contacting being in the substantial absence of molecular oxygen and at a temperature in the range of from about 120° C. to 400° C., said scavenger comprising an essentially oil-insoluble solid composite having (1) a copper component and (2) a porous carrier component, having a surface area in the range of from about 20 to 1000 square meters per gram, said copper component being at least one thiol absorbing material selected from the group consisting of copper metal and copper compounds, and said carrier component being at least one carrier selected from the group consisting of inorganic refractory metal oxides and carbon, said contacting being continued so long as the resulting effluent oil has a thiol-sulfur content, calculated as sulfur, in the range below about 0.2 ppm.

4,163,709

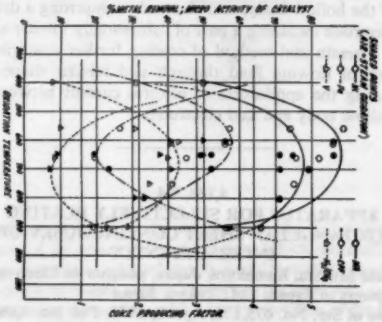
CATALYST DEMETALLIZATION BY OXIDATION IN A DEFINED TEMPERATURE RANGE

Emmett H. Burk, Glenwood; Jin S. Yoo, South Holland; John A. Karch, Chicago, and Jui-Yuan Sun, South Holland, all of Ill., assignors to Atlantic Richfield Company, Philadelphia, Pa.

Division of Ser. No. 695,687, Jun. 14, 1976, Pat. No. 4,102,811. This application Feb. 13, 1978, Ser. No. 877,438

Int. Cl.[2] B01J *29/28, 8/24;* C10G *11/06*

U.S. Cl. 208—120 **17 Claims**



1. In a catalytic cracking process for converting a metals contaminated hydrocarbon feedstock to more valuable, lower boiling hydrocarbon products in a cracking reaction zone wherein the cracking catalyst is poisoned and contaminated by

metals present in the feedstock, the improvement which comprises

(i) withdrawing at least a portion of said metal contaminated catalyst from the cracking reaction zone;

(ii) contacting at least a portion of said metal contaminated catalyst with at least one sulfur containing compound to provide a catalyst containing sulfur and metal compounds;

(iii) contacting said catalyst containing sulfur and metal compounds with an oxygen-containing gas at a temperature maintained within the range of from 550° C. to 725° C. for a time sufficient to promote subsequent metal compounds removal by converting at least a portion of said metal compounds on a promoted catalyst to a dispersible form;

(iv) removing at least a portion of the metal compounds from the promoted catalyst;

(v) recovering a catalyst of reduced metal content and improved catalytic activity; and

(vi) returning at least a portion of said catalyst of reduced metal content and improved catalytic activity to the catalytic cracking reaction zone.

4,163,710

CRACKING PROCESS EMPLOYING A COMBINATION OF REDUCTIVE AND OXIDATIVE WASHES

Emmett H. Burk, Glenwood; Jin S. Yoo, South Holland; John A. Karch, Chicago, and Jui-Yuan Sun, South Holland, all of Ill., assignors to Atlantic Richfield Company, Philadelphia, Pa.

Division of Ser. No. 695,662, Jun. 14, 1976, Pat. No. 4,101,444. This application Feb. 13, 1978, Ser. No. 877,457

Int. Cl.[2] B01J *29/38, 8/24;* C10G *11/06*

U.S. Cl. 208—120 **19 Claims**

1. In a process for converting a metals contaminated hydrocarbon feedstock to more valuable, lower boiling hydrocarbon products in a cracking reaction zone wherein a cracking catalyst is poisoned and contaminated by metals present in the feedstock, the improvement which comprises:

(i) withdrawing at least a portion of said catalyst with contaminating metals from the cracking reaction zone;

(ii) converting at least a portion of the contaminating metals to a dispersible form in a promoted catalyst;

(iii) removing at least a portion of the contaminating metals from the promoted catalyst by (a) contacting the promoted catalyst with a liquid reductive wash medium, and (b) subsequently contacting the reductively washed catalyst with a liquid oxidative wash medium;

(iv) recovering a catalyst of reduced metals content and improved catalytic activity; and,

(v) returning at least a portion of said catalyst of reduced metals content to the cracking reaction zone.

4,163,711

CHEMICAL CONVERSION METHOD

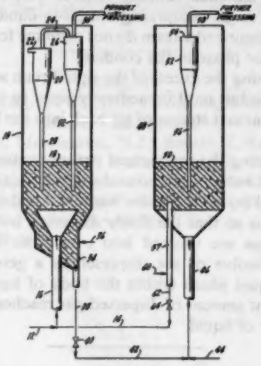
Lloyd A. Baillie, Homewood, Ill., assignor to Atlantic Richfield Company, Philadelphia, Pa.

Division of Ser. No. 660,207, Feb. 23, 1976, Pat. No. 4,081,249. This application Jan. 5, 1978, Ser. No. 867,064

Int. Cl.[2] C10G *11/18*

U.S. Cl. 208—161 **10 Claims**

1. In a method for hydrocarbon conversion wherein in a reaction zone hydrocarbon feedstock is contacted with solid particles capable of promoting said hydrocarbon conversion at hydrocarbon conversion conditions to form at least one hydrocarbon conversion product and a mixture of solid particles and vapor, the major portion by weight of said solid particles having diameters in the range from about 10 microns to about 500 microns, the improvement which comprises: contacting said hydrocarbon feedstock with said solid particles and separating at least a portion of said solid particles from said mixture in a separation means comprising a chamber defined by an interior cylindrical surface; an inlet means in fluid communication with both said reaction zone and said chamber to allow entry of said mixture to said chamber, said inlet means being situated so that the movement of said mixture in said chamber causes solid particles to preferentially move toward said cylindrical surface; a fluid outlet means in fluid communication with said chamber to allow at least a portion of said vapor of said mixture to exit from said chamber; and a particle outlet means in fluid communication with said chamber to allow at least a



portion of said solid particles to exit from said chamber; the improvement which comprises:

arresting means located in spaced relation to said interior cylindrical surface to slow the velocity of at least a portion of said solid particles as said solid particles preferentially move toward said cylindrical surface, thereby inhibiting the attrition of said solid particles.

4,163,712

TREATMENT OF LIQUID

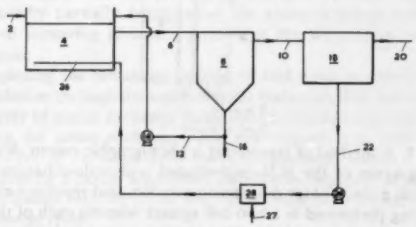
Kenneth C. Smith, Essex, England, assignor to BOC Limited, London, United Kingdom

Continuation-in-part of Ser. No. 430,260, Jan. 3, 1974, abandoned. This application Jun. 12, 1975, Ser. No. 586,390

Claims priority, application United Kingdom, Jan. 8, 1973, 1027/73; Mar. 1, 1973, 10082/73; Jun. 26, 1973, 30236/73

Int. Cl.[2] C02C *1/06*

U.S. Cl. 210—7 **20 Claims**



1. In a process for providing a dissolving within a body of liquid at generally atmospheric pressure a gas which is sparingly soluble in the liquid by removing a portion of the liquid as a stream of liquid, and pressurizing the stream of liquid during introduction of the sparingly soluble gas into the stream of liquid prior to introduction of the pressurized stream of liquid back into the body of liquid, the improvement which comprises the steps of:

(a) passing the pressurized stream of liquid through a conduit and introducing the gas into the conduit under turbulent conditions as a substantially inner gas phase of undissolved gas bubbles at a rate to provide in the pressurized stream 100% to 1500% by weight of undissolved gas in excess of the equilibrium saturation value of said gas in said liquid at the pressure of said pressurized stream to establish a gas-

in-liquid dispersion comprising finely dispersed bubbles of undissolved gas which are carried within the pressurized stream of liquid in the conduit without any significant formation of a discrete vapor phase or significant dissolution of said dispersion in the conduit;

(b) maintaining the rate of flow of the liquid in the conduit at least at a minimum limiting value at which the bubbles of undissolved gas comprising the gas-in-liquid phase carried in the pressurized stream do not combine to form a significant vapor phase in the conduit;

(c) maintaining the excess of the equilibrium saturation of (a) in the conduit until immediately prior to introduction of the pressurized stream of (a) back into the body of liquid; and

(d) introducing the pressurized stream containing the finely dispersed bubbles of undissolved gas of (a) as maintained in (b) and (c) back into the body of liquid under turbulent conditions so that the finely dispersed bubbles of undissolved gas are sheared into even finer bubbles which either dissolve or are dispersed as a generally discrete gas-in-liquid phase within the body of liquid before any significant amount of dispersed gas reaches the surface of the body of liquid.

4,163,713

RECOVERY OF COLOR DEVELOPER

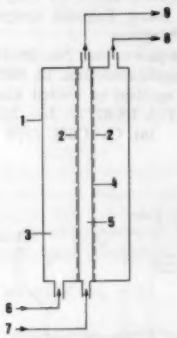
Patrick J. Keogh, London, England, assignor to Ciba-Geigy AG, Basel, Switzerland

Filed Nov. 21, 1977, Ser. No. 853,605

Claims priority, application United Kingdom, Dec. 9, 1976, 51336/76

Int. Cl.² B01D *13/00, 11/00*

U.S. Cl. 210—22 C **5 Claims**



1. A method of recovering a photographic colour developing agent of the N,N-disubstituted p-phenylenediamine type from a used colour developing solution, said recovery method being performed in a two cell system wherein each of the cell members is provided with a stirring means and is separated from the other by a reinforced, semipermeable non-porous membrane which is less than 100 microns thick and which has imbibed therein an organic solvent of low water solubility in which the colour developing agent is soluble, said membrane being composed of natural or synthetic rubbers, polyolefin, halogenated polyolefin, polyvinyl chloride/ester copolymer or polystyrene, each of which are sufficiently cross-linked to prevent complete disintegration in the organic imbibed therein, and being further attached to a glass sieve member or is sandwiched between two glass sieve members, which method comprises placing the used colour developing solution into one cell member and allowing the colour developing agent to diffuse through the semi-permeable non-porous membrane into the organic solvent and then into an aqueous acid solution present in the second cell member.

4,163,714

SEPARATING SUBSTANCES WITH PRESSURE-DRIVEN AFFINITY SORPTION MEMBRANES

Harry P. Gregor, 150 Lakeview Ave., Leonia, N.J. 07605

Filed Nov. 7, 1975, Ser. No. 629,939

The portion of the term of this patent subsequent to Apr. 30, 1991, has been disclaimed.

Int. Cl.² B01D *13/00*; C07G *7/00*

U.S. Cl. 210—23 F **3 Claims**

1. A process which comprises forcing a solution of a ligand through a homoporous homogeneous ultrafiltration membrane under a pressure equivalent to at least about 10 psig, said membrane having an average pore size of about 15 to 200 Angstroms in diameter and being receptive to coupling said ligand, removing excess liquid, forcing through said ligand-coupled membrane under a pressure equivalent to at least about 10 psig a solution of a mixture of substances of which at least one substance but not all has an affinity for said ligand whereby said one substance is selectively extracted from said mixture and held as a complex by said ligand, said membrane having pores averaging in size from about 3 to 10 times the diameter of the ligand-substance complex.

4,163,715

METHOD FOR TREATMENT OF WASTE WATER

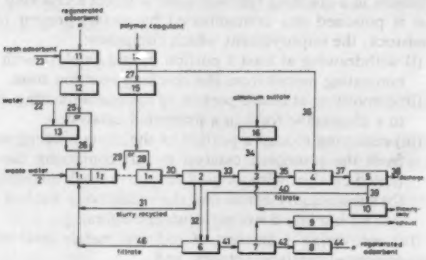
Yoshikatsu Ikari, Narashino; Shiyoichiro Yokoyama, Musashimurayama, and Keisuke Katoh, Hiratsuka, all of Japan, assignors to Agency of Industrial Science & Technology and Sumitomo Jukikai Envirotech, Inc., both of Tokyo, Japan

Filed Oct. 3, 1977, Ser. No. 838,973

Claims priority, application Japan, Oct. 5, 1976, 51/119614

Int. Cl.² C02B *1/14*

U.S. Cl. 210—28 **6 Claims**



1. A method for treating waste water which comprises:

(a) a step in which the waste water is blended with inorganic adsorbent powder to adsorb chromaticity and COD components contained in the waste water into the adsorbent powder, said adsorbent powder being selected from the group consisting of magnesia alone and magnesia in admixture with another metal oxide, said magnesia in each adsorbent powder being obtained by calcining a compound selected from the group consisting of magnesium hydroxide, magnesium carbonate, basic magnesium carbonate, and mixtures thereof,

(b) a step in which the mixture of water and adsorbent thus obtained is subjected to a sedimentation treatment to separate the adsorbent powder with adsorbed chromaticity and the COD components as a slurry layer,

(c) a step in which water of the upper layer is discharged from the step (b),

(d) a step in which the adsorbent slurry of the lower layer is taken out of the step (b),

(e) a step in which a portion of the adsorbent slurry taken out is returned to the adsorption step (a),

(f) a step in which the remainder of the adsorbent slurry taken out is subjected to a dehydration treatment,

(g) a step in which the dehydrated adsorbent is calcined in a gas containing less than 10% of oxygen for 10–30 minutes

and then in a gas containing 10–25% oxygen for 10–30 minutes,

(h) a step in which the regenerated adsorbent is recycled to the adsorption step (a).

4,163,716

PROCESS FOR THE PURIFICATION OF CONTAMINATED WATER

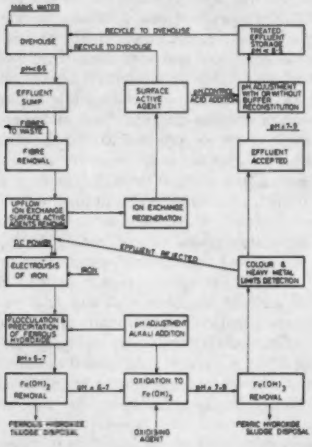
Roy H. Turnbull, Westville, South Africa, assignor to Feltex Limited, South Africa

Continuation of Ser. No. 655,849, Feb. 6, 1976, abandoned, which is a continuation-in-part of Ser. No. 516,496, Oct. 21, 1974, abandoned. This application Oct. 4, 1977, Ser. No. 839,352

Claims priority, application South Africa, Oct. 22, 1973, 73/8172

Int. Cl.[2] C02B *1/16, 1/20*

U.S. Cl. 210—28 **7 Claims**



1. A process for the purification of aqueous acid effluent from a dyehouse and containing dissolved solids without substantially building up the total dissolved solids content in the effluent, said effluent being effluent of pH less than 6.5 from a dying process and which is contaminated with at least one dye, heavy metal ions and surface active agents, but substantially free from fibres, which process comprises the steps of

(i) subjecting the acid effluent to upflow ion-exchange to remove surface active agents present;

(ii) thereafter passing the treated effluent to an electrolysis bath containing iron electrode which introduces sufficient ferrous ions from the iron electrode into the treated effluent to form a ferrous hydroxide flocculate by passing an electric current between said iron electrode through the effluent thereby the iron electrode is consumed during the electrolysis;

(iii) removing said formed ferrous hydroxide flocculate and adhering heavy metal hyroxides and dyes from the effluent at a pH of 6 to 7.;

(iv) adjusting the pH of said effluent to within the range 7 to 9 and causing oxidation of any ferrous ions remaining to ferric ions by means of at least one oxidizing agent selected from air, any oxidizing agent present in the effluent and added oxidizing agents to precipitate the ferrous hydroxide as ferric hydroxide; and

(v) removing the precipitated ferric hydroxide with adhering heavy metal hydroxides to leave a treated effluent;

(vi) subjecting the treated effluent to an examination for acceptable color and determination of the heavy metal content;

(vii) recycling any treated effluent which is of unnacceptable color or which has an unacceptably high heavy metal content to the electrolysis step (ii), and repeating steps (ii) to (vi), thereby increasing the total content of ferrous ions introduced from the iron electrode into the effluent, the actual content of ferrous ions being dependent on the content of heavy metal ions in the effluent;

(viii) adjusting the pH of the treated effluent from step (vi) which has an acceptable color and an acceptably low heavy metal content to a pH below 6.5 and

(ix) recycling the treated effluent from step (viii) back to the dyehose.

4,163,717

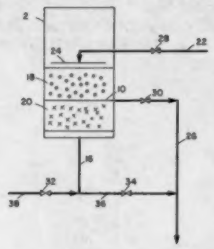
REMOVAL OF SILICA FROM MIXED BED DEMINERALIZER

Roger A. Blind, Morristown, N.J.; Robert T. Saterbak, Baytown, Tex., and Edward I. Wolfe, Whippany, N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Dec. 15, 1977, Ser. No. 860,690

Int. Cl.[2] C02B *1/70*

U.S. Cl. 210—31 R **12 Claims**



1. A process for regenerating the anion exchange resin and the cation exchange resin comprising a mixed bed demineralizer wherein the ion exchange capacity of said resins has been reduced during contact with water containing mineral salts and silica, which comprises:

(a) separating said resins into a layer of anion exchange resin and a layer of cation exchange resin by backwashing;

(b) passing through said layer of anion exchange resin from about 30 to about 80 volume % of at least the amount of an anion regenerant solution required to replace the ions exchanged from the resin during contact with said water, thereby partially regenerating the anion exchange resin and removing at least a portion of the silica from said resin;

(c) passing the remaining portion of said anion regenerant solution through the layer of anion exchange resin and the layer of cation exchange resin, thereby further regenerating the anion exchange resin and removing at least a portion of the silica from the cation exchange resin;

(d) passing a cation regenerant solution through the cation exchange resin of (c) so as to regenerate said cation exchange resin.

4,163,718

COMPLEXING AGENTS FOR PHENOLICS

Thomas A. Chamberlin, and Norman L. Madison, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 639,152, Dec. 9, 1975, Pat. No. 4,011,160, which is a division of Ser. No. 554,380, Mar. 3, 1975, Pat. No. 4,001,147. This application Jan. 24, 1977, Ser. No. 761,555

The portion of the term of this patent subsequent to Mar. 1, 1994, has been disclaimed.

Int. Cl.[2] C02B *1/20*

U.S. Cl. 210—54 **8 Claims**

1. A method of complexing phenolics comprising contacting

a phenol with an acylated polyamine bearing a plurality of units corresponding to the formula

$$\left[\begin{array}{l} \text{N}-\text{CR}_1\text{R}_2-\text{CR}_3\text{R}_4 \\ | \\ \text{O}=\text{C}-\text{R}_5 \end{array}\right]_n \text{X}$$

wherein: R_1–R_4 are each independently hydrogen, lower alkyl or hydroxy-substituted lower alkyl of from 1 to about 6 carbon atoms, with the proviso that at least 2 of R_1–R_4 are hydrogen; R_5 is hydrogen, phenyl or alkyl of from 1 to about 24 carbon atoms; n is an integer of at least 1; and X is a terminal inorganic or organic group.

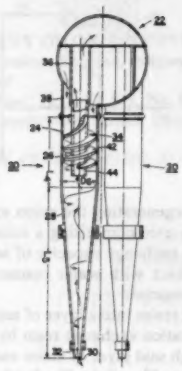
2. The method of claim 1 conducted in an aqueous medium.

4,163,719

HYDROCYCLONE SEPARATOR ARRANGEMENT

Jacek J. Maciorewicz; Johannes J. Richters, and James E. St. John, all of Calgary, Canada, assignors to Elast-O-Cor Products & Engineering Limited, Canada

Filed Sep. 7, 1977, Ser. No. 831,283
Claims priority, application Canada, Jan. 26, 1977, 270494
Int. Cl.² B01D *21/26*
U.S. Cl. 210—84 **9 Claims**



1. A hydrocyclone separator including a body having a wall defining an elongated chamber of generally circular cross-section and shaped such that it decreases in cross-sectional size from a large end to a smaller apex end, a reject outlet at the apex end and an accept outlet at the large end, both being located in axial alignment with said chamber, and means for feeding a liquid suspension generally tangentially into said chamber whereby to form a liquid vortex in said chamber surrounding a central air core extending longitudinally of the chamber, the feeding means including guide vane means defining channel means for the flow of said suspension therethrough, and wherein said accept outlet comprises an elongated tubular member defining an annular region between itself and the wall of said chamber with said guide vane means being located in the annular region and extending between said tubular member and the wall of the chamber such that the channel means has a width determined by the distance from said tubular member to said wall of said chamber throughout the length thereof, said guide vane means defining:

(a) a transition section wherein the guide vane means are disposed at a shallow angle to the longitudinal axis of the chamber at the large end thereof to initially receive the feed suspension in a path of travel directed generally longitudinally of the chamber with such angle gradually increasing so as to gradually swing said suspension from motion in the generally longitudinal direction to motion in the form of a spiral around the longitudinal axis of said chamber, said channel means also being of gradually decreasing cross-sectional area along the length thereof to effect gradual acceleration of the suspension in said transition section, and

(b) a helical section of constant lead smoothly connected to said transition section, wherein said channel means defined by the guide vane means in said helical section is of substantially constant cross-sectional area along the length thereof, to cause the accelerated suspension to rotate around the chamber axis to impart centrifugal and shear forces thereto and to effect partial separation of the suspension prior to entry of the suspension into the separation chamber across substantially the full width of the annular region between said tubular member and the wall of the chamber.

8. A method of separating suspensions in a hydrocyclone separator including a body having a wall defining an elongated chamber of generally circular cross-section and shaped such that it decreases in cross-sectional size from a large end to a smaller apex end with a reject outlet for heavier portions of the suspension at the apex end and a tubular accept outlet for lighter portions of the suspension at the large end, both being located in axial alignment with said chamber, the accept outlet defining an annular region between itself and the chamber wall and having guide vane means in said annular region defining a transition section wherein the guide vane means are initially at a shallow angle to the longitudinal axis of the chamber and a helical section of constant lead smoothly connected to said transition section, the method including feeding a liquid suspension into said chamber whereby to form a liquid vortex in said chamber surrounding a central air core extending longitudinally of the chamber, said step of feeding the liquid suspension including passing the feed suspension into the separator via the full area of the annular region defined between the accept outlet and the chamber wall and in a path of travel initially directed generally longitudinally of the chamber in the transition section and then gradually swinging said suspension from motion in the generally longitudinal direction to motion in the form of a spiral path around the longitudinal axis of the chamber while gradually accelerating the suspension by way of a gradual reduction in the cross-sectional area of the flow path of the suspension along its length as it travels along the transition section, the width of said path being at all times equal to the distance between the tubular accept outlet and the chamber outlet and the chamber wall, and then causing the suspension to enter the helical section and to rotate around the chamber axis while travelling in a flow path of substantially constant cross-sectional area to impart centrifugal forces thereto so as to induce heavier particles in the suspension to move radially outwardly to the wall of the chamber before the suspension enters into the separation chamber and feeding the suspension generally tangentially into the separation chamber in a path whose width is defined by the distance between said tubular accept outlet and the chamber wall.

4,163,720

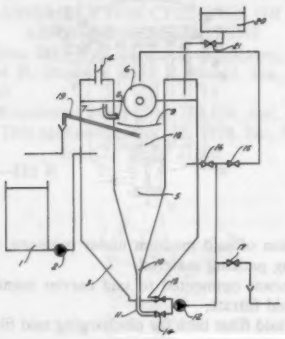
APPARATUS FOR THE BIOLOGICAL PURIFICATION OF WASTE WATER

Hans Müeller, Erlenbach, Switzerland, assignor to PEC Process Engineering Company SA, Maennedorf, Switzerland

Filed Mar. 6, 1978, Ser. No. 884,632
Claims priority, application Switzerland, Mar. 4, 1977, 2715/77
Int. Cl.² C02C *1/26*
U.S. Cl. 210—197 **9 Claims**

1. An apparatus for the multistage biological purification of waste water containing organic substances including carbohydrates and proteins, the apparatus comprising in combination an at least substantially closed first tank having a first inlet for waste water and a first outlet for withdrawing sludge produced by an aerobic degradation in said first tank, the latter being operative for holding the waste water at least substantially free from contact with air so as to prevent further oxygen from becoming dissolved in the waste water; means communicating

with said first tank for admitting a pH regulating substance into the same; a second tank located inside said first tank and including an aerator in a top portion of said second tank for dissolving oxygen in the waste water contained in said second tank, said second tank having a second outlet for withdrawing sludge produced by aerobic degradation of the waste water in said second tank; at least one conduit connecting said first tank with said second tank for conducting the waste water from said first tank into said second tank, said conduit having a first end within said first tank and a second end within said second tank above the level of said second outlet; means for recycling some of said sludge to the respective tanks; guide means including a



baffle plate in said second tank located below said second end of said conduit and operative for guiding the sludge produced by aerobic degradation alongside the walls of said second tank towards said second outlet thereof; first means for withdrawing purified water from said second tank, including a conduit having one end portion in said second tank below said guide means and another end portion extending outwardly away from and beyond said first and second tanks second withdrawing means connected to the respective first and second outlets and leading away from said first and second tanks for withdrawing sludge therefrom; and regulating means connected to said second withdrawing means for regulating withdrawal of sludge from said first and second tanks.

4,163,721

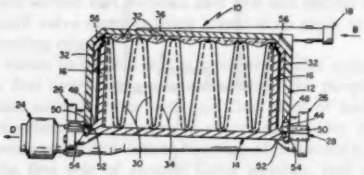
EDGE SEALED PLEATED MEMBRANE

Donn D. Lobdell, Golden, Colo., assignor to Cobe Laboratories, Inc., Lakewood, Colo.

Continuation of Ser. No. 784,362, Apr. 4, 1977, abandoned. This application May 15, 1978, Ser. No. 906,064

Int. Cl.[2] B01D *31/00, 13/00*

U.S. Cl. 210—232 **6 Claims**



1. A fluid flow transfer apparatus comprising:

a housing,

a pleated membrane within said housing,

said housing including first and second interfitting casings,

said first and second casings each having a base and a pair of sidewalls in a generally U-shaped cross section, the sidewalls of said second casing fitting between the sidewalls of said first casing to define a fluid chamber between said bases,

said sidewalls of said second casing being spaced along their outer surfaces from the inner surfaces of the respective sidewalls of said first casing, to define a pair of membrane sealing compartments, said membrane being contained in said fluid chamber but having a pair of opposed outermost flaps extending into but not beyond said membrane sealing compartments, where said membrane flaps are sealed to said housing,

said sealing compartments being wide enough to allow introduction of adhesive into said sealing compartments after said casings are interfitted whereby adhesive can be placed on both surfaces of each of said outermost membrane flaps to bond each of them to said sidewalls defining each of said sealing compartments,

said base of said second casing includes a pair of shelf portions, one of said pair extending outwardly beyond each of the sidewalls of said second casing for contacting each of said sidewalls of said first casing thereby to close said sealing compartments and fully enclose the ends of said outermost membrane flaps,

said sidewalls of said second casing having tops that are spaced sufficiently from the inner surface of the base of said first casing along portions of the length of said sidewalls when said casings are interfitted so that said tops and said inner surface do not pinch said membrane along said sidewall length portions, and

said housing further including means for connecting said first casing sidewalls to said second casing shelf portions to prevent adhesive in said sealing compartments from going to the outside of said housing.

4,163,722

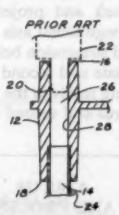
UNIVERSAL DIALYZER END CAP

Louis C. Cosentino, Wayzata; Louis Seiler, Minneapolis, and Richard A. Helms, Elk River, all of Minn., assignors to Renal Systems, Inc., Minneapolis, Minn.

Filed Feb. 14, 1978, Ser. No. 877,620

Int. Cl.[2] B01D *31/00*

U.S. Cl. 210—236 **6 Claims**

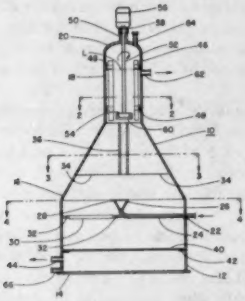


1. A universal dialyzer end cap comprising: a member having an elongated opening passing completely therethrough, one end of said opening adapted to receive a nipple of a kidney dialyzer and the other end of said opening adapted to have permanently secured therein a blood tubing line; said one end of said opening having a cross-sectional diameter which is smaller than the cross-sectional diameter of said other end, said one end of said opening having a narrowing taper of approximately 5° extending partially toward said other end of said opening such that when said one end is secured on a nipple of a dialyzer and said other end has a blood tubing line secured therein, the nipple will be firmly force fitted into the blood line to provide a tight connection and such that blood flowing between the dialyzer and the blood line is not able to contact the inner surface of said member.

4,163,723
CONTINUOUSLY OPERATED LIQUID-SOLIDS SEPARATOR

Giuliano Romano, Englewood, N.J., and Michael A. Rismondo, Houston, Tex., assignors to National Petro Chemicals Corporation, New York, N.Y.

Filed Oct. 28, 1977, Ser. No. 846,471
Int. Cl.[2] B03B 5/36; C02C 1/28
U.S. Cl. 210—319 17 Claims



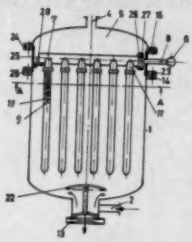
1. In an apparatus for the continuous separation of solids from a liquid suspension thereof and in which said solids have a tendency to float upwardly in the liquid; an upright tank comprising a lower cylindrical section, an upwardly-reducing imperforate frusto-conical intermediate section coextensive with said lower section, and an upper smaller-diameter cylindrical section coextensive with said frusto-conical intermediate section, said tank being essentially cylindrical in transverse section, and further having a bottom end wall; liquid suspension inlet means communicating with said tank at a level intermediate the upper and lower ends thereof; a first outlet aperture in said tank proximate the lower end thereof located in a plane below said inlet means; a second outlet aperture in said tank proximate the upper end thereof located in a plane above said liquid suspension inlet means; vertically extending baffles in said tank disposed intermediate said inlet means and said second outlet aperture for inhibiting swirling movement of said liquid suspension, said vertically extending baffles comprising a plurality of plate members spaced about the inner circumferential wall of said tank and projecting radially inwardly towards the vertical longitudinal axis of said tank; and means for agitating said liquid suspension being disposed in said tank in the region intermediate said second outlet aperture and said inlet means for impelling solids in the liquid suspension in said region upwardly towards said second outlet aperture for withdrawal from said tank.

4,163,724
PRESSURE FILTER AND PROCESS FOR CLEANING IT

Hans Müller, Erlenbach, and Konstantin Sotirianos, Stafa, both of Switzerland, assignors to Chemap AG, Maennedorf, Switzerland

Filed Sep. 13, 1977, Ser. No. 832,979
Claims priority, application Switzerland, Sep. 16, 1976, 11854/76; Nov. 23, 1976, 14743/76; Dec. 18, 1976, 16050/76; Dec. 24, 1976, 16362/76; Jan. 12, 1977, 445/77; Feb. 9, 1977, 1759/77; Feb. 9, 1977, 1760/77; May 18, 1977, 6172/77; Jun. 8, 1977, 7039/77
Int. Cl.[2] B01D 29/14
U.S. Cl. 210—323 T 18 Claims

1. A pressure filter for media to be filtered comprising
a filter tank, optionally including an air passage;
an inlet to said tank for introducing said medium under pressure;
a hollow carrier member removably supported in said filter tank;
a plurality of hollow elongated flexible filter members supported in rows by said carrier member;
an outer filter wall provided on said flexible filter elements adapted to hold back the matter to be filtered out;
an inner space provided in said flexible filter member adapted to receive the filtrate penetrating through said outer wall, said inner space communicating with the interior of said hollow carrier member;
means operative to fill said inner space of said flexible filter member and to support said flexible filter member during

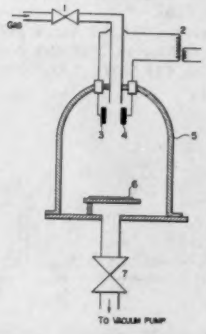


introduction of said medium under pressure, said means comprising packing material;
discharge means connected to said carrier member for receiving said filtrate;
an outlet in said filter tank for discharging said filter residue; and
means for opening and closing said filter tank, whereby after opening of the tank all or groups of said filter elements may be removed together for cleaning or replacement by means of removal of said carrier member.

4,163,725
PROCESS FOR PREPARING OF SEMIPERMEABLE MEMBRANES

Takezo Sano, Takatsuki; Takatoshi Shimomura, Toyonaka; Masao Sasaki, Osaka; Ichiki Murase, Ibaraki, and Manabu Hirakawa, Toyonaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Jan. 24, 1977, Ser. No. 761,904
Claims priority, application Japan, Feb. 2, 1976, 51-10485
Int. Cl.[2] C08J 3/24, 3/28, 7/10
U.S. Cl. 210—490 6 Claims



1. A method for the production of semipermeable membranes, which comprises
exposing porous shaped articles of polysulfone having a form of film, sheet, tube or hollow fiber or being composite with another porous support and having pores of 100 to 1000 A in size on the surface thereof, to plasma generated by glow discharge of a gas selected from the group consisting of helium, argon, nitrogen, oxygen, hydrogen,

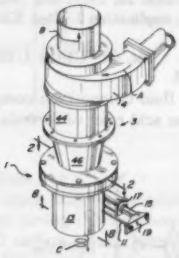
carbon monoxide, carbon dioxide, ammonia, and water under a pressure of 0.01 to 10 Torr to form a dense, cross-linked surface layer of no more than one micron in thickness.

4,163,726

VALVE ASSEMBLY FOR CYCLONES OR OTHER ABRASIVE APPLICATIONS

Peter C. Wilson, 2415-D.S. Xanadu Way, Denver, Colo. 80232, and Robert P. Hughart, 9451 E. Grand Ave., Englewood, Colo. 80110

Continuation-in-part of Ser. No. 792,126, Apr. 29, 1977, abandoned. This application Mar. 30, 1978, Ser. No. 891,544
Int. Cl.[2] B01D *21/26*
U.S. Cl. 210—512 R **47 Claims**



36. An assembly comprising:

hydrocyclone means for separating material from a carrier fluid, said hydrocyclone means having an inlet and first and second outlets whereby material being conveyed in said carrier fluid enters said hydrocyclone means through said inlet and is substantially separated from said carrier fluid, said fluid exiting said hydrocyclone through said first outlet and said material exiting said hydrocyclone through said second outlet, and

said hydrocyclone means further including a valve means for controlling the flow of said material through said second outlet, said valve means having

(i) at least three valve members, each valve member having first and second end portions spaced from each other and having at least first and second substantially planar sides extending substantially between said first and second end portions, said first and second sides of each valve member being joined at an angle to form a leading edge,

(ii) means to support said at least three valve members in a first overlapping position adjacent the periphery of said second outlet with said first sides of said valve members encompassing a space, each valve member being supported with the leading edge thereof touching the first side of another valve member, said support means including means to mount the leading edge of each valve member near the first end portion thereof to said means for substantially pivotal movement relative to said support means, and

(iii) means to move said valve members toward each other to control the flow of material through said second outlet of said hydrocyclone means whereby the leading edges of each valve member pivot relative to said support means and converge near the second end portions of the valve members.

4,163,727

ACIDIZING-GEL COMPOSITION

Clyde G. Inks, Taylor, Mich., assignor to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Dec. 5, 1977, Ser. No. 857,590
Int. Cl.[2] E21B *43/27*
U.S. Cl. 252—8.55 C **14 Claims**

1. A composition of matter useful for acidizing rock strata in the secondary recovery of petroleum, said composition consisting essentially of

(a) a proportion effective to attack rock strata of an acid selected from the group consisting of hydrochloric acid, hydrofluoric acid, formic acid, acetic acid, and mixtures thereof;

(b) a proportion, effective to cause said composition to gel at the temperature of said rock strata but sufficiently low to cause said composition to remain liquid at ambient temperature, of a nonionic surfactant of molecular weight between 4000 and 30,000, said surfactant being of a formula selected from the group consisting of

$$HO(C_2H_4O)_a(C_3H_6O)_b(C_2H_4O)_cH$$

and

$$H(C_2H_4O)_y(C_3H_6O)_x \quad (C_3H_6O)_x(C_2H_4O)_yH$$
$$\diagdown \quad N-CH_2-CH_2-N \quad \diagup$$
$$H(C_2H_4O)_y(C_3H_6O)_x \quad (C_3H_6O)_x(C_2H_4O)_yH$$

wherein

a, b, and c are integers such that the poly(oxyethylene) hydrophilic portion of the molecule accounts for at least 25 percent of its molecular weight and the poly(oxypropylene) hydrophobic portion has a molecular weight greater than 2150 and

wherein x and y are integers such that the poly(oxyethylene) hydrophilic portion of the molecule accounts for at least 40 percent of its molecular weight and the molecular weight of the poly(oxypropylene) hydrophobic portion of the molecule is at least 3250, and if the proportion of the molecular weight of the molecule accounted for by the polyoxyethylene units is less than 55 percent, greater than 5250; and

(c) water.

4,163,728

PREPARATION OF MAGNESIUM-CONTAINING DISPERSIONS FROM MAGNESIUM CARBOXYLATES AT LOW CARBOXYLATE STOICHIOMETRY

William J. Cheng, and David B. Guthrie, both of St. Louis, Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Filed Nov. 21, 1977, Ser. No. 853,600
Int. Cl.[2] C10M *3/18, 5/14, 7/20, 7/24*
U.S. Cl. 252—18 **16 Claims**

1. A process of preparing a stable, fluid magnesium-containing dispersion which consists essentially of decomposing a magnesium carboxylate to MgO in a non-volatile process fluid capable of being heated to the decomposition temperature of the magnesium carboxylate also containing a dispersant capable of retaining the magnesium oxide formed by the decomposition in stable suspension at a temperature greater than about 230° C., said process containing less than a stoichiometric amount of carboxylate, based on $Mg(OH)_2$ or equivalent.

4,163,729
SYNERGISTIC COMBINATIONS OF HYDRATED POTASSIUM BORATE, ANTIWEAR AGENTS, AND ORGANIC SULFIDE ANTIOXIDANTS

John H. Adams, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 636,386, Nov. 28, 1975, Pat. No. 4,089,790. This application Mar. 29, 1978, Ser. No. 891,415
The portion of the term of this patent subsequent to May 16, 1995, has been disclaimed.
Int. Cl.[2] C10M *3/18, 5/14, 7/20, 7/24*
U.S. Cl. 252—18 **16 Claims**

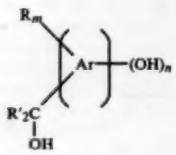
1. A lubricating oil composition containing dispersed therein (1) from 0.1 to 60 weight percent of a particulate hydrated potassium borate having a mean particle size less than 1 micron and having a boron-to-potassium ratio of 2.5 to 4.5 and containing from 0.01 to 5 waters of hydration, (2) from 0.01 to 5 weight percent of an antiwear agent selected from (a) a zinc dihydrocarbyl dithiophosphate having from 4 to 20 carbons in each hydrocarbyl group, (b) a C_1 to C_{20} ester, C_1 to C_{20} amide, or C_1 to C_{20} amine salt of a dihydrocarbyl dithiophosphoric acid having from 4 to 20 carbons in each hydrocarbyl group, (c) a zinc alkyl aryl sulfonate; and (d) mixtures thereof, and (3) from 0.1 to 5 weight percent of an oil-soluble antioxidant organic sulfur compound containing from 3 to 40 weight percent sulfur, which sulfur is present as an organic sulfide or polysulfide or mixtures thereof.

4,163,730
HYDROXYALKYL HYDROXY-AROMATIC CONDENSATION PRODUCTS AS LUBRICANT ADDITIVES

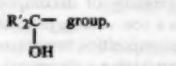
Charles P. Bryant, Euclid, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Division of Ser. No. 678,101, Apr. 19, 1976, Pat. No. 4,108,784, which is a continuation-in-part of Ser. No. 459,750, Apr. 9, 1974, abandoned. This application Apr. 28, 1978, Ser. No. 901,173
Int. Cl.[2] C10M *1/32*
U.S. Cl. 252—34.7 **16 Claims**

1. A lubricant composition comprising a major amount of at least one lubricating oil and a minor, but engine sludge dispersing, amount of a product made by the process comprising reacting at a temperature ranging from about 50° C. to about 300° C. (A) at least one alpha hydroxyalkyl hydroxy aromatic compound of the general formula



wherein Ar is a hydrocarbyl aromatic nucleus of 6 to about 30 carbon atoms, said aromatic nucleus substituted with 1 to 3 lower alkoxy, lower alkylthio, chloro, or nitro substituents, each R is a nonfused hydrocarbyl group of about 25 to about 700 carbon atoms, each R′ is independently a hydrogen atom, an alkyl group of 1 to 36 carbon atoms, or a halogen-substituted alkyl group of 1 to about 36 carbon atoms, n is 1 to 3 and m is 1 to 5 with the provisos that (i) the total number of carbon atoms in the R′ groups does not exceed 36 and (ii) where m exceeds 1, one of the R groups can also be a



with

(B) at least one hydrocarbyl, alpha-beta olefinically unsaturated compound selected from the group consisting of C_{2-40} nitriles, and ammonium and metal salts of C_{2-40} carboxylic acids; the ratio of (A) to (B) is between about 0.5:1 to about 2:1, and the reaction of (A) with (B) resulting in the formation of a carbon-to-carbon bond, said bond including the carbon of at least one

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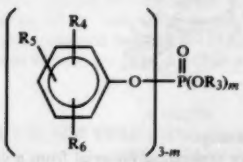
4,163,731
FIRE RESISTANT FUNCTIONAL FLUID COMPOSITIONS BASED ON PHOSPHATE ESTERS AND SUBSTITUTED AROMATIC COMPOUNDS

Donald R. Randell, Stockport; Thomas G. Hyde, Sale; Frank Lamb, Bury; Brian G. Clubley, Sale, and William D. Phillips, Stockport, all of England, assignors to Ciba-Geigy AG, Basel, Switzerland

Filed Oct. 26, 1977, Ser. No. 846,223
Claims priority, application United Kingdom, Oct. 28, 1976, 44752/76
Int. Cl.[2] C10M *3/40*
U.S. Cl. 252—78.5 **16 Claims**

1. A functional fluid composition comprising

(a) a phosphorus acid ester of formula II



(II)

in which

m is an integer from 0 to 3,

R_4, R_5 and R_6, which may be the same or different, are hydrogen, alkyl having 1 to 9 carbon atoms, cycloalkyl having 6 to 12 carbon atoms, haloalkyl having 1 to 9 carbon atoms, but excluding halomethyl, said haloalkyl groups containing one or more chlorine atoms, chloro, aryl having 6 to 10 carbon atoms or aralkyl having 7 to 12 carbon atoms, and

R_3 is alkyl having 1 to 16 carbon atoms or haloalkyl containing one or more chlorine atoms; and

(b) a compound of formula I

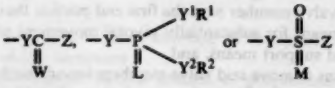
$$R(CH_2X)_n \qquad \text{(I)}$$

in which

R represents an aromatic hydrocarbon or aromatic heterocyclic containing residue,

n is an integer of at least 2, and

each X is the same or different and represents halo, OH, SH, NH_2, COOH, PO_3H_2, $OB(OH)_2$, OR^1, SR^1, NHR^1, NR^1R^2, $OB(OR^1)$ (OR^2),

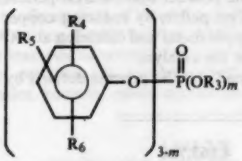


where Y, Y^1 and Y^2 are independently —O—, —NH—, —NR^1—, —S— or a direct bond,

Z is hydrogen, R^1, OR^1, SR^1, NH_2, NHR^1, NR^1R^2 or a direct bond linking

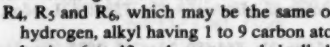
to R or to a CH_2 attached to R,
W is O, S, NH or NR^1,
L is O, S or is absent,
M is O, S or is absent, and
R^1 and R^2 are independently a straight or branched chain alkyl having 1 to 12 carbon atoms, alkenyl having 2 to 12 carbon atoms, alkynyl having 2 to 12 carbon atoms, cycloalkyl having 5 to 12 carbon atoms, cycloalkenyl having 5 to 12 carbon atoms, aralkyl having 7 to 12 carbon atoms, araalkenyl having 7 to 12 carbon atom or alkaryl having 7 to 12 carbon atoms.

11. A functional fluid composition comprising
(a) a phosphorus acid ester of formula II

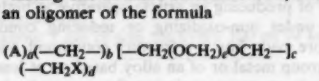


(II)

in which
m is an integer from 0 to 3.
R_4, R_5 and R_6, which may be the same or different, are hydrogen, alkyl having 1 to 9 carbon atoms, cycloalkyl having 6 to 12 carbon atoms, haloalkyl having 1 to 9 carbon atoms, but excluding halomethyl, said haloalkyl groups containing one or more chlorine atoms, chloro, aryl having 6 to 10 carbon atoms or aralkyl having 7 to 12 carbon atoms, and
R_3 is alkyl having 1 to 16 carbon atoms or haloalkyl containing one or more chlorine atoms; and
(b) an oligomer of the formula



wherein
A is at least one aromatic hydrocarbon or aromatic heterocyclic residue, X is OH, $OB(OH)_2$, OR^1, $OB(OR^1)(OR^2)$,



where Y, Y^1 and Y^2 are O,
Z is hydrogen, R^1, OR^1, SR^1, NH_2, NHR^1, NR^1R^2 or a direct bond linking

to A or to a CH_2 attached to A,
W is O, S, NH or NR^1,
L is O, S or is absent,
M is O or is absent, and
R^1 and R^2 are independently a straight or branched chain alkyl having 1 to 12 carbon atoms, alkynyl having 2 to 12 carbon atoms, cycloalkenyl having 5 to 12 carbon atoms, aralkyl having 7 to 12 carbon atoms, aralkenyl having 7 to 12 carbon atoms or aralkyl having 7 to 12 carbon atoms,
a is 2 to 20, but equals b+c+1,
b is 0 to 19,
c is 0 to 19,
e is 0 to 10, and
d is 0 to 2*a*, but with the proviso that when c is 0, d must be at least 2, and when c is 1, d must be at least 1, so that thereare at least two (—CH X) groups per molecule, the ($—CH_2OCH_2—$) group counting as ($—CH_2X$) for this purpose.

4,163,732

DETERGENT COMPOSITION CONTAINING WATER-INSOLUBLE PHOSPHORUS-CONTAINING ALUMINOSILICATE BUILDERS

Fumio Sai, Funabashi, and Moriyasu Murata, Chiba, both of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Nov. 21, 1977, Ser. No. 853,245
Claims priority, application Japan, Dec. 6, 1976, 51-146727
Int. Cl.[2] C11D *3/36, 3/08, 7/36*
U.S. Cl. 252—99 **9 Claims**

1. A detergent composition consisting essentially of 3 to 95% by weight of a water-insoluble, phosphorus-containing alkali metal aluminosilicate having the formula (I):

$$x(M_2O)\cdot Al_2O_3\cdot y(SiO_2)\cdot z(P_2O_5)\cdot w(H_2O) \quad (I)$$

wherein M is an alkali metal selected from the group consisting of sodium and potassium, x, y, z and w are the mole numbers of the respective components, wherein x, y and z satisfy the following relationships:

$0.50 \leqq x \leqq 1.10$,

$0.80 \leqq y \leqq 2.50$, and

$0.05 \leqq z \leqq 0.80$,

and w is zero or an optional positive number, from 1 to 50% by weight of water-soluble organic surfactant selected from the group consisting of anionic, nonionic and amphoteric water-soluble organic surfactants, and mixtures thereof;
from zero to 50% by weight of water-soluble alkali metal builder salt and mixtures thereof, and from 1 to 50% by weight of water-soluble substance selected from the group consisting of alkali metal silicates, alkali metal carbonates, alkali metal sulphates and mixtures thereof.

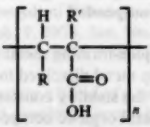
4,163,733

SYNERGISTIC COMPOSITIONS FOR CORROSION AND SCALE CONTROL

John D. Buckman; Gerald D. Mercer, and John D. Pera, all of Memphis, Tenn., assignors to Buckman Laboratories, Inc., Memphis, Tenn.

Filed Oct. 25, 1977, Ser. No. 845,011
Int. Cl.[2] C02B *5/06*
U.S. Cl. 252—180 **20 Claims**

1. A corrosion and scale inhibiting composition consisting essentially of on a weight basis: about 10 to about 90% dimethylaminoethylenebis-(phosphonic acid) or a water-soluble salt thereof, a water-soluble polymer having a linear hydrocarbon structure with side chain carboxylic groups exemplified by the structure:



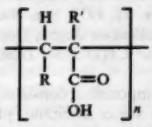
wherein R is hydrogen or —COOH and R′ is hydrogen or methyl in an amount varying from about 10 to about 90% and one or more of the following:

A. Water

B. about 0 to 25% of an aqueous solution of phosphorous acid or an alkali metal salt thereof, or

C. about 1.5 to about 13.5% of an aqueous solution of a water soluble zinc salt.

11. A process for inhibiting corrosion and scaling of metal surfaces in water systems consisting essentially in adding to water in said systems an effective amount of a composition consisting essentially of on a weight basis: about 10 to about 90% dimethylaminomethylenebis (phosphonic acid) or a water-soluble salt thereof, a water-soluble polymer having a linear hydrocarbon structure with side chain carboxylic acid groups exemplified by the structure:



wherein R is hydrogen or —COOH and R′ is hydrogen or methyl in an amount varying from about 10 to about 90% and one or more of the following:

A. Water

B. about 0 to 25% of an aqueous solution of phosphorous acid or an alkali metal salt thereof, or

C. about 1.5 to about 13.5% of an aqueous solution of a water-soluble zinc salt.

4,163,734

REFERENCE LIQUID FOR BLOOD GAS EQUIPMENT

Søren K. Sørensen, Glostrup, and Carl C. Holbek, Allerød, both of Denmark, assignors to Radiometer A/S, Copenhagen, Denmark

Continuation of Ser. No. 652,817, Jan. 27, 1976, abandoned. This application Jan. 5, 1978, Ser. No. 866,951

Claims priority, application Denmark, May 30, 1975, 2449/75

Int. Cl.[2] C09K *3/00*

U.S. Cl. 252—408 **9 Claims**

1. A stable synthetic water based reference liquid for quality control and/or calibration of blood gas measuring equipment, said liquid being enclosed in a gas-tight container and containing HCO_3^- ions, H^+ ions, CO_2 gas, and O_2 gas plus an additional pH buffer system different from the pH buffer system constituted by the HCO_3^- ions and the CO_2 gas, said liquid showing, at a fixed temperature, known pH, pCO_2 and pO_2 values, said liquid additionally containing oxygen reversibly contained in a dispersed non-proteinaceous organic substance which shows higher solubility for oxygen than does water, and, optionally, a coloring component showing maximum or significant absorption at about 500 nm, said organic substance being

(a) a water-insoluble organic substance in which O_2 is soluble to an extent of at least 12% by volume at 1 atmosphere oxygen pressure and 25° C., said water-insoluble substance being a liquid of lipoid character emulsified in a liquid-in-water type emulsion, in the water base of the reference liquid, or a solid suspended in the water base of the reference liquid, or

(b) an oxygen complex-forming metal organic compound of a transition group metal dissolved in the water base of the reference liquid, the stability constant of the oxygen complex of which metal organic compound is in the range of 1×10^3 to $10^{5.5}$.

4,163,735

CATALYST PREPARATION METHOD

John A. Fetchin, and William F. Marzluff, both of Stamford, Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jul. 25, 1977, Ser. No. 818,775

Int. Cl.[2] B01J *27/20*; C01B *31/24, 33/24*

U.S. Cl. 252—443 **5 Claims**

1. A process for the preparation of copper-magnesium silicate-carbonate catalyst containing about three to five parts by wt copper per part magnesium for the hydration reaction of a nitrile with water comprising:

A. Preparing a precipitate of insoluble carbonates and silicates of magnesium and copper by addition of soluble magnesium and copper salts in aqueous solution to soluble silicate and carbonate compounds in aqueous solution,

B. Separating the precipitated solids from the mother liquor, drying the filtered solids at drying temperatures in the range from 170° to 200° C., and powdering the dry solids,

C. Tableting the dry powdered solids with added tableting lubricants to make the powder into catalyst pellets, and

D. Activating the catalyst pellets by reducing copper compounds therein to copper metal and calcining at 300° C. to 400° C. to strengthen the catalyst.

3. Hydration catalyst made by the process defined by claim 1.

4,163,736

METHOD OF PRODUCING PLATINUM-CLAD ARTICLES

Gary J. K. Acres, and Alan S. Darling, both of London, England, assignors to Johnson, Matthey & Co., Limited, London, England

Continuation of Ser. No. 558,689, Mar. 17, 1975, abandoned, which is a division of Ser. No. 263,169, Jun. 15, 1972, abandoned. This application Feb. 28, 1977, Ser. No. 772,739

Claims priority, application United Kingdom, Jun. 16, 1971, 28315/71

Int. Cl.[2] B01J *21/04, 23/40, 35/02*

U.S. Cl. 252—466 PT **3 Claims**

1. A method of producing an article operative at high temperatures and under non-oxidizing or reducing conditions comprising a core made from a refractory compound, a sheath of a platinum group metal or of an alloy based on at least one metal of the platinum group enclosing the core and a barrier layer intermediate the core and the sheath, comprising flame spraying onto the core a mixture of magnesia and a small amount of alumina to form said barrier layer and subsequently applying the platinum group metal or alloy over said barrier layer, the refractory core being selected from the group consisting of refractory oxides, carbides, nitrides, sulphides, silicides and ceramic materials and the amount of alumina in said mixture being such that it facilitates spraying while retaining the chemical characteristics of magnesia rather than alumina in the resultant deposit.

4,163,737

SUBSTITUTED BICYCLOOCTENEMETHANOLS, PROCESS FOR PRODUCING SAME AND USES OF SAME FOR AUGMENTING OR ENHANCING THE ORGANOLEPTIC PROPERTIES OF TOBACCOS, PERFUMES AND PERFUMED ARTICLES

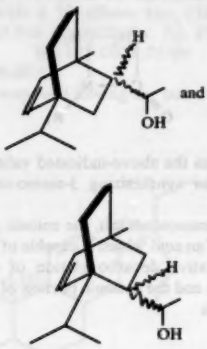
James M. Sanders, Eatontown; Joaquin F. Vinals, Red Bank, and Frederick L. Schmitt, Holmdel, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 780,685, Mar. 23, 1977. This application Jun. 8, 1978, Ser. No. 913,735

Int. Cl.[2] C11B *9/00*

U.S. Cl. 252—522 **4 Claims**

1. A fragrance modifying composition comprising at least one bicyclo[2.2.2]octene derivative having a formula selected from the group consisting of:



or a mixture thereof wherein the wavy lines represent exo and endo configurations of the ethanol moiety with respect to the carbon-carbon double bond of the bicyclo[2.2.2]octene moiety, and at least one adjuvant selected from the group consisting of natural perfume oils, synthetic perfume oils, other alcohols, aldehydes, ketones, esters, nitriles and lactones.

4,163,738

WASHABLE NON-SPLATTER INK

William C. Corwin, La Grange, Ill., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Mar. 14, 1978, Ser. No. 886,363

Int. Cl.[2] C08L *33/24*

U.S. Cl. 260—29.6 ME **6 Claims**

1. An ink for use in oscillographic pen recorders comprising:
(a) a water based solvent;
(b) about 10 mgm of polyacrylamide for every 100 ml of said solvent;
(c) about 20 mgm of an antibacterial agent for every 100 ml of said solvent;
(d) about 20 mgm of an antioxidant for every 100 ml of said solvent; and
(e) about 7 gm of dye for every 100 ml of said solvent.

4,163,739

COPOLYMER SOLUTION CONSISTING OF ACRYLIC RESIN, PROCESS FOR ITS MANUFACTURE AND THE USE THEREOF IN REACTIVE LACQUERS

Horst Dilibor, Norderstedt, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Apr. 21, 1977, Ser. No. 789,661

Claims priority, application Fed. Rep. of Germany, Apr. 29, 1976, 2618809

Int. Cl.[2] C08K *5/00, 5/01, 5/04; C08F 220/62*

U.S. Cl. 260—31.2 R **10 Claims**

1. Copolymer solution consisting of A) 10 to 30% by weight of inert organic solvent and B) 70 to 90% by weight of copolymers which have been manufactured by heating to 150° to 180° C., in the presence of mixtures of diacyl peroxides or peresters and alkyl hydroperoxides or dialkyl peroxides as the polymerisation initiators, a mixture of inert solvents having a boiling range of 150° to 180° C. and the component to be esterified, that is to say a) 5–24% by weight of glycidyl esters of α-alkylalkanemonocarboxylic acids and/or α,α-dialkylalkanemonocarboxylic acids of the following empirical formula $C_{12-14}H_{20-26}O_3$, or a mixture of glycidyl esters of α, α-dialkylalkanemonocarboxylic acids having a content up to about 10 percent by weight of the mixture of glycidyl esters of α-alkylalkanemonocarboxylic acids of the said empirical formula, the mixture having an epoxide equivalent of 240 to 250, with the slow, uniform addition of b) 12–30% by weight of hydroxyethyl acrylate and/or hydroxyethyl methacrylate, c) 1–10% by weight of acrylic acid, d_1) 20–50% by weight of styrene and d_2) 5–35% by weight of methyl methacrylate, the components a, b, c, d_1 and d_2 having been employed in such quantities that their sum adds up to 100% by weight and the polymerisation and condensation reactions proceeding simultaneously and jointly and the additional condition applying that the components a, b and c have been employed in such quantities that the copolymers have a hydroxyl group content of 3.5 to 6.5% by weight, it being necessary that the components A and B add up to 100% by weight.

4,163,740

PROCESS FOR THE PREPARATION OF POLYSTYRYLPYRIDINE

Bernard P. Malassine, Vert le Petit; Jean-Claude C. Gautier, Ablon sur Seine; Sammy H. Chevalier, Paris, and Gérard R. Berteleau, Ris Orangis, all of France, assignors to Societe Nationale des Poudres et Explosifs, Paris, France

Filed Jan. 19, 1978, Ser. No. 870,854

Claims priority, application France, Jan. 25, 1977, 77 01955

Int. Cl.[2] C08G *12/26*

U.S. Cl. 260—31.2 N **10 Claims**

1. A process for the preparation of a resin solution for use in the preparation of a composite material by impregnation which consists of carrying out the polycondensation of at least an aromatic dialdehyde and at least one pyridinic derivative substituted by at least two reactive methyl groups at a temperature between 150° C. and 200° C. with an excess of the pyridinic derivative, stopping the reaction after the extent of condensation is equal to 50–63%, essentially totally eliminating the excess of the pyridinic derivative and dissolving the polycondensate so obtained in a solvent which is (1) ethyl acetate, (2) methylene chloride, (3) trichloroethylene, (4) chlorobenzene, (5) ethanol, (6) n-propanol or (7) a mixture of n-propanol and a solvent which is a member selected from the group consisting of (a) methylethylketone (b) ethyl acetate (c) methylene chloride (d) trichloroethylene (3) chlorobenzene (f) ethanol.

4,163,741

SAND MOLD COMPOSITIONS CONTAINING AS CATALYST, METHYL ALCOHOL SOLUTIONS OF BENZENESULPHONIC ACID

Sergie S. Zhukovsky, Profsojuznaya ulitsa, 17, korpus 1, kv. 15, Moscow; Nikolai I. Shadrin, Leninsky prospekt, 5, kv. 15, Donetsk; Sergei D. Teplyakov, Seleznevskaya ulitsa, 13, kv. 3, Moscow, all of U.S.S.R.; Abram M. Lyass, deceased, late of Moscow, U.S.S.R., and by Inna E. Lyass, administrator, Sharikopodshipnikovskaya ulitsa, 2, kv. 42, Moscow, U.S.S.R.

Filed Apr. 15, 1977, Ser. No. 787,764

Int. Cl.[2] C08K *3/36, 5/05, 5/42*

U.S. Cl. 260—33.4 R **10 Claims**

1. A cold setting composition for making cores and molds consisting essentially of 100 parts by weight of a refractory filler, between 1.0 and 3.0 parts by weight of a resol phenol-formaldehyde resin binder and between 0.4 and 2.0 parts by weight of a crystal hydrate benzenesulphonic acid catalyst in the form of an 80- to 92-percent solution in methyl alcohol, whereby said cores and molds have compression strength of at least 60 N/cm^2.

4,163,742

PROCESS AND PRODUCT PREPARED FROM TETRAFLUOROETHYLENE RESIN AND GRAPHITE FIBERS

Jacob F. Mansure, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

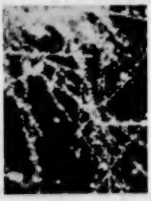
Filed Feb. 9, 1978, Ser. No. 876,339

Int. Cl.[2] C08K *3/04, 7/06*

U.S. Cl. 260—42.17 **7 Claims**

1. Process for preparing a blend of a melt-fabricable tetrafluoroethylene resin and graphite fibers which comprises mixing (a) melt-fabricable tetrafluoroethylene resin particles having an

average size by weight of less than 400 μm in an amount sufficient to result in 50%–90% by weight of the blend being resin particles and (b) graphite fibers, in a mixture of water and a water-miscible organic solvent in which the amount of organic



solvent in the mixture of water and solvent is between about 1 and 90 percent by weight of solvent and water, and then separating the blend of resin and graphite fibers from the mixture of water and solvent.

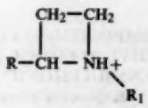
4,163,743

BETA-LACTAMS, THEIR PRODUCTION FROM AZETIDINE CARBOXYLIC ACIDS, INTERMEDIATES THERETO AND DERIVATIVES THEREOF

Harry H. Wasserman, and Alan W. Tremper, both of New Haven, Conn., assignors to Research Corporation, New York, N.Y.

Filed Sep. 8, 1977, Ser. No. 831,441
Int. Cl.[2] C07D *205/08, 407/06, 403/06, 405/06*
U.S. Cl. 260—239 A **9 Claims**

1. A process for preparing a lactam which comprises reacting an ammonium salt, the anionic portion of which is the anion of an acid which is capable of forming iminium salts by oxidative deacrboxylation of a corresponding tertiary amine and the cationic portion of which is a cation of the formula

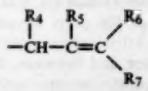


wherein

R is the residue of a hydrocarbon aryl peracid, alkyl peracid or alkyl hydroperoxide formed by removal of a single hydrogen atom therefrom; and

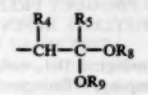
R_1 is selected from the group consisting of:

(a) an alkenyl group of the formula



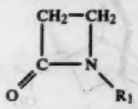
wherein R_4 is p-alkoxyphenyl or p-benzyloxyphenyl and R_5, R_6 and R_7 are each hydrogen or alkyl of 1–3 carbon atoms; and

(b) an acetal of the formula



wherein R_4 and R_5 have the above-indicated values while R_8 and R_9 are each alkyl of 1–6 carbon atoms or together form alkylenedioxy of 2–4 carbon atoms;

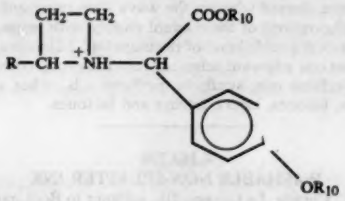
with a strong base having a pK_b of at least 10^{-5} to form a corresponding cyclic lactam of the formula:



wherein R_1 has the above-indicated values.

8. A method for synthesizing 3-amino-nocardicinic acid, which comprises:

(a) reacting an ammonium salt, the anionic portion of which is the anion of an acid which is capable of forming iminium salts by oxidative decarboxylation of a corresponding tertiary amine and the cationic portion of which is a cation of the formula

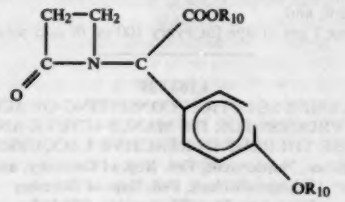


wherein

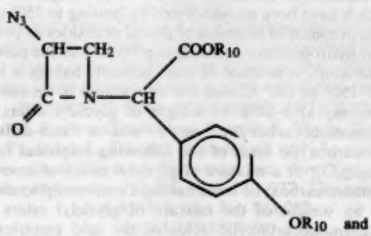
R is the residue of a hydrocarbon aryl peracid, alkyl peracid or alkyl hydroperoxide formed by removal of a single hydrogen atom therefrom; and

R_{10} is alkyl of 1–4 carbon atoms, benzyl or benzhydryl

with a strong base having a pK_b of at least 10^{-5} to form a corresponding beta-lactam of the formula:



(b) introducing an azide group $-N_3$ into the 3-position of said beta-lactam to form a corresponding beta-lactam azide of the formula



(c) reducing the azide group to a primary amino group $—NH_2$ and cleaving the hydroxyl masking groups R_{10} to form said 3-aminonocardicinic acid.

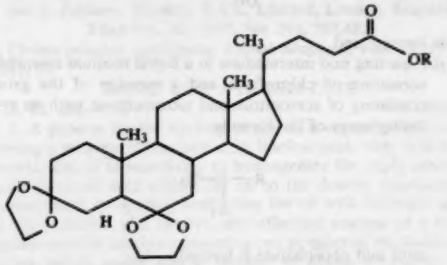
4,163,744

SYNTHESIS OF STEROIDS

Emil T. Kaiser, 5634 S. Woodlawn Ave., Chicago, Ill. 60637

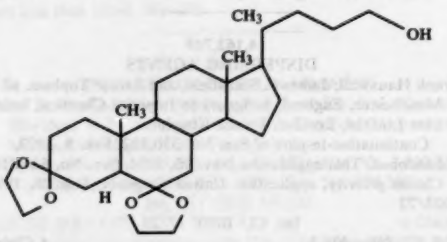
Filed Feb. 10, 1978, Ser. No. 876,753
Int. Cl.² C07J *21/00*
U.S. Cl. 260—239.55 C **10 Claims**

1. A steroid compound having the structure

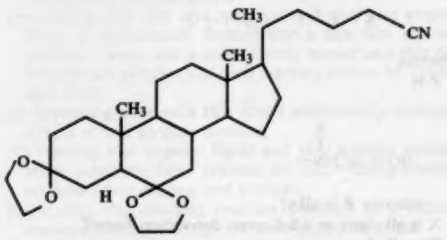


in which R is a lower alkyl group.

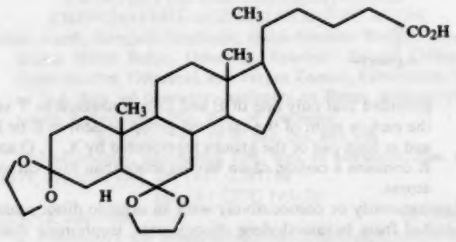
3. A steroid compound having the structure



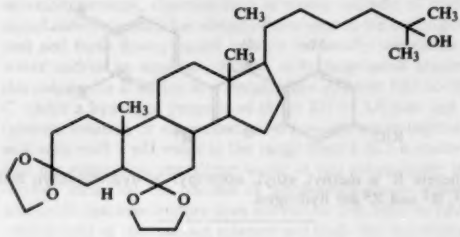
6. A steroid compound having the structure



7. A steroid compound having the structure



10. A steroid compound having the structure



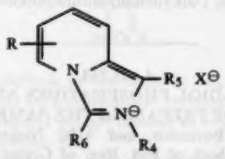
4,163,745

IMIDAZO[1,5-A]-QUINOLINIUM AND IMIDAZO[1,5-A]-PYRIDINIUM COMPOUNDS

Donald E. Kuhla, Gales Ferry, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 712,204, Aug. 6, 1976, Pat. No. 4,044,015, which is a continuation-in-part of Ser. No. 609,914, Sep. 3, 1975, abandoned. This application Aug. 8, 1977, Ser. No. 822,414
Int. Cl.² C07D *471/04*
U.S. Cl. 546—84 **11 Claims**

1. A compound selected from the group consisting of:



wherein R is hydrogen or the carbon and hydrogen atoms completing a fused 6,7-benzo moiety; R_4 is selected from the group consisting of alkyl having one to three carbon atoms, benzyl and substituted benzyl wherein said substituent is selected from the group consisting of chloro and dichloro; R_5 and R_6 are each selected from the group consisting of phenyl and hydrogen, provided that when R_5 and R_6 are each hydrogen, R_4 is selected from the group consisting of benzyl and substituted benzyl wherein said substituent is selected from the group consisting of chloro and dichloro; and X is a pharmaceutically acceptable anion.

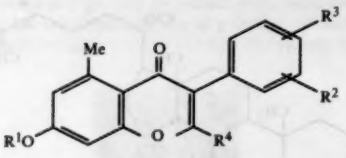
4,163,746

METABOLIC 5-METHYL-ISOFLAVONE-DERIVATIVES, PROCESS FOR THE PREPARATION THEREOF AND COMPOSITIONS CONTAINING THE SAME

László Feuer; Lóránd Farkas; Mihály Nógrádi; Borbala Vermes; Agnes Gottsegen, and András Wolfner, all of Budapest, Hungary, assignors to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt., Budapest, Hungary

Continuation-in-part of Ser. No. 486,513, Jul. 8, 1974, abandoned. Filed Oct. 26, 1977, Ser. No. 845,680
Claims priority, application Hungary, Jul. 9, 1973, CI 1396
Int. Cl.² C07D *311/02*
U.S. Cl. 260—345.2 **5 Claims**

1. An anabolically effective compound for use as a pharmaceutical or a feed additive of the formula



wherein R' is methyl, ethyl, isopropyl or hydroxyethyl; and R^2, R^3 and R^4 are hydrogen.

4,163,747

PROCESS FOR THE PREPARATION OF 1-ALKYLAMINO-ANTHRAQUINONES

Bernd Schroeder, Odenthal; Rudolf Braden, Odenthal-Scheuren; Wolfgang Auge; Karl-Werner Thiem, both of Cologne, and Rütger Neeff, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 806,406, Jun. 14, 1977, abandoned. This application Sep. 22, 1978, Ser. No. 944,935

Claims priority, application Fed. Rep. of Germany, Jul. 1, 1976, 2629524

Int. Cl.[2] C07C *97/24*

U.S. Cl. 260—378 **10 Claims**

1. Process for the preparation of a 1-alkylamino-anthraquinone, which comprises reacting 1-nitroanthraquinone with a monoalkylamine in molar ratios of alkylamine to 1-nitroanthraquinone of at least 2:1 at 150°–220° C. in the presence of an ether or of a hydrocarbon or of a mixture of these compounds and separating the 1-alkylamino-anthraquinone from the reaction mixture.

4,163,748

PROPANE-1,3-DIOL PHOSPHATIDES AND METHOD OF PREPARING THE SAME

Hansjörg Eibl, Bovenden, and Alfar Nicksch, Goettingen-Nikolausberg, both of Fed. Rep. of Germany, assignors to Max-Planck-Gesellschaft zur Forderung der Wissenschaften E.V., Goettingen, Fed. Rep. of Germany

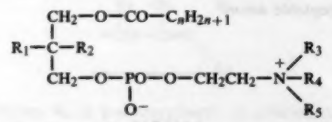
Continuation of Ser. No. 689,538, May 24, 1976, abandoned, which is a continuation of Ser. No. 501,135, Aug. 28, 1974, abandoned. This application Oct. 31, 1977, Ser. No. 846,717

Claims priority, application Fed. Rep. of Germany, Sep. 6, 1973, 2345057

Int. Cl.[2] A23J *7/00*; C07F *9/02*

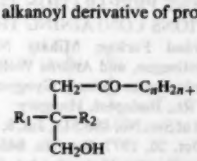
U.S. Cl. 260—403 **6 Claims**

1. A method of preparing a phosphatide of the formula

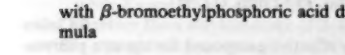


which comprises:

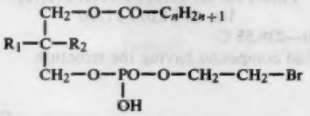
(a) reacting an alkanoyl derivative of propane-1,3-diol of the formula



with β-bromoethylphosphoric acid dichloride of the formula



until an intermediate of the formula



is formed; and

(b) reacting said intermediate in a liquid medium essentially consisting of chloroform and a member of the group consisting of acetonitrile and nitromethane with an aminating agent of the formula

until said phosphatide is formed;

in said formulas, n being an integer between 9 and 25, R_1 and R_2 being hydrogen or alkyl having one to six carbon atoms,

R_3, R_4, R_5 having hydrogen or methyl, at least one of said R_3, R_4, R_5 being hydrogen.

4,163,749

DISPERSING AGENTS

Frank Hauxwell; James F. Stansfield, and Arthur Topham, all of Manchester, England, assignors to Imperial Chemical Industries Limited, London, United Kingdom

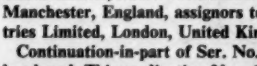
Continuation-in-part of Ser. No. 330,882, Feb. 8, 1973, abandoned. This application Nov. 25, 1974, Ser. No. 526,918

Claims priority, application United Kingdom, Feb. 28, 1972, 9033/72

Int. Cl.[2] B01F *17/28*

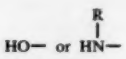
U.S. Cl. 260—404.5 **6 Claims**

1. A dispersant formed by by reacting a polymethylene glycol having from 5 to 10 carbon atoms and an ester of the formula



wherein

Z is



wherein R is alkyl

X is alkylene or a halogeno derivative thereof

T is alkylene

n is an integer from 1 to 8

Q is alkyl or hydroxyalkyl

and E and D are

provided that only one of E and D is connected to T via the carbon atom of the carbonyl group present in E or D and at least one of the groups represented by X, T, Q and R contains a carbon chain having more than four carbon atoms,

simultaneously or consecutively with an organic diisocyanate selected from hexamethylene diisocyanate, isophorone diisocyanate, 4,4'-diisocyanato-diphenylamine, 2:4-diisocyanatotoluene and 2:6-diisocyanatotoluene in the presence of an inert

organic solvent at a temperature up to the boiling point of the reaction medium.

4,163,750

PROCESS FOR THE HYDROGENATION OF A VEGETABLE OIL

Alfred J. Bird, Hounslow; Timothy M. Priestley, Twickenham, and John M. Winterbottom, Solihull, all of England, assignors to Johnson, Matthey & Co., Limited, London, England

Filed Feb. 10, 1977, Ser. No. 767,483

Claims priority, application United Kingdom, Feb. 11, 1976, 5385/76

Int. Cl.[2] C11C *3/12*; B01J *21/18*

U.S. Cl. 260—409 8 Claims

1. A process for the hydrogenation of a vegetable oil comprising a mixture of linolenic acid, linoleic acid, oleic acid and stearic acid so as selectively to hydrogenate the triply unsaturated linolenic acid within the oil to the doubly unsaturated linoleic acid, comprising contacting the oil with hydrogen gas in the presence of a catalytically effective amount of a supported metallic catalyst containing one or more of the platinum group metals under kinetic control to obtain a product in which the triply unsaturated fatty acid is substantially completely converted to only the doubly unsaturated fatty acid with substantially no trans isomerization so as to produce a product of substantially cis form, said product being predominantly linoleic and oleic acid and having an iodine content of not less than about 100–110.

4,163,751

THIN FILM REACTION PROCESS

John E. Van der Mey, Stirling, N.J., and Frank J. Kremers, Elbridge, N.Y., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Division of Ser. No. 387,844, Aug. 13, 1973, Pat. No. 3,902,857. This application May 16, 1975, Ser. No. 578,245

Int. Cl.[2] C07C *141/00*

U.S. Cl. 260—457 6 Claims

1. A process for reacting a thin film of an organic liquid with a gaseous medium comprising the steps of:

(a) introducing said organic liquid onto two oppositely facing reacting surfaces of a spinning disc rotatable in a substantially vertical plane;

(b) rotating said disc at a velocity such that said organic liquid is continuously formed into a thin film on each reacting surface and is continuously moved as a thin film towards the periphery of each reacting surface by centrifugal force;

(c) depositing over each thin film a substantially undiluted stream of said gaseous medium;

(d) reacting said organic liquid and said gaseous medium under subatmospheric pressure on said rotating reacting surfaces while cooling said surfaces;

(e) moving the resulting reaction products in a radially outward direction along each reacting surface; and

(f) collecting said reaction products.

4,163,752

PROCESS FOR THE PREPARATION OF AMINONAPHTHALENESULPHONIC ACIDS

Otto Barth, Bergisch-Gladbach; Hans-Joachim Becker, Leverkusen; Horst Behre, Odenthal; Reinhard Kaiser, Cologne; Guido Steffan, Odenthal, and Jürgen Zander, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 11, 1978, Ser. No. 868,558

Claims priority, application Fed. Rep. of Germany, Jan. 26, 1977, 2703076; Oct. 25, 1977, 2747714

Int. Cl.[2] C07C *143/56*

U.S. Cl. 260—508 18 Claims

1. Process for the preparation of an aminonaphthalene-sulphonic acid by the catalytic hydrogenation of salts of nitronaphthalene-sulphonic acids, with hydrogen in the presence of a Raney nickel catalyst at elevated temperature and under elevated pressure, characterized in that a mixture of Raney nickel catalyst which has already been used in the hydrogenation and fresh Raney nickel catalyst is initially suspended in water and/or an aqueous solution of hydrogenated product, this suspension is heated to a temperature of about 100° to 180° C. under a hydrogen pressure of about 100 to 300 bars and an aqueous solution or suspension of nitronaphthalene-sulphonic acid salts with a pH value in the range from 6 to 9 is metered into the suspension containing water at this temperature in a manner such that the content of nitronaphthalene-sulphonic acid in the reaction mixture does not exceed 3%, relative to the total weight of the reaction mixture and such that the concentration of aminonaphthalene-sulphonic acids which is finally reached is about 5 to 40% relative to the total weight of the reaction mixture.

4,163,753

PROCESS FOR THE SIMULTANEOUS PREPARATION OF AROMATIC ACID CHLORIDES AND ALIPHATIC ACID CHLORIDES

Philip M. Pivawer, Hamden, Conn., assignor to Diaz Chemical Corporation, Holley, N.Y.

Filed Feb. 14, 1977, Ser. No. 768,330

Int. Cl.[2] C07C *51/00*, *53/14*, *63/10*

U.S. Cl. 260—544 D 19 Claims

1. A process for preparing an aromatic acid chloride and an aliphatic acid chloride comprising the following steps:

A. mixing an aliphatic carboxylic acid anhydride having the structure

where R is an aliphatic carbon chain having between one and six carbon atoms, with an aromatic compound having one or more trichloromethyl groups bonded to non-adjacent carbon atoms of the aromatic ring;

B. heating the mixture in the presence of a strong acid catalyst selected from the group consisting sulfuric and phosphoric acid, until the aliphatic carboxylic acid chloride begins to distill;

C. distilling the aliphatic carboxylic acid chloride; and

D. recovering the aromatic acid chloride from the reaction mixture.

4,163,754

FLUORINATED SULFONAMIDES

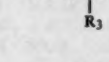
Jean S. Y. Lew, Wilmington, Del., assignor to ICI Americas Inc., Wilmington, Del.

Continuation of Ser. No. 772,513, Feb. 28, 1977, abandoned, which is a division of Ser. No. 664,741, Mar. 8, 1976, abandoned. This application Jan. 18, 1978, Ser. No. 870,577

Int. Cl.[2] C07C *143/72*

U.S. Cl. 428—378 11 Claims

1. A fluorinated sulfonamide compound having formula:



wherein

X is $C_{2\text{-}10}$ alkylene optionally interrupted by one or more oxygen groups,

R_1 is hydrogen,

n is an integer from zero to four,

R_2, and R_4 are a $C_{12\text{-}30}$ acyl radical or a radical having the formula

in which R_f is a linear or branched C_{2-16} perfluoro alkenyl radical and in which Y is a C_{2-10} alkylene optionally interrupted with one or more oxygen atoms or an arylene radical, where R_8 is independently hydrogen, a C_{12-30} acyl radical or a radical having the formula

$$R_fO(Y)SO_2-$$

wherein R_f and Y have the aforestated meanings with the proviso that amongst the values of R_2, R_3 and R_4 there must be at least one C_{12-30} acyl radical and at least one radical having the formula

$$R_fO(Y)SO_2-$$

in which R_f and Y have the aforestated meanings.

4,163,755

PROCESSING OF ACRYLAMIDE SOLUTIONS; CONCENTRATION WITHOUT POLYMER FORMATION

Ken Matsuda; Martin S. Butensky, both of Stamford; Kin H. Tsu, Norwalk, and Robert J. Munch, Stamford, all of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Continuation of Ser. No. 604,379, Aug. 13, 1975, which is a continuation of Ser. No. 410,456, Oct. 29, 1973, abandoned. This application Jan. 13, 1977, Ser. No. 759,318

Int. Cl.[2] C07C *103/133, 103/00*; B01D *1/00, 1/16*

U.S. Cl. 260—561 N **5 Claims**

1. In a process of concentrating acrylamide aqueous solution from less than 50% acrylamide to more concentrated liquid aqueous solution by flash evaporation of water from the solution at reduced pressure below atmospheric in evaporation apparatus having stainless steel surfaces contacting the concentrated solution, the improvement wherein cupric ion is in the concentrated liquid solution in the range from 5 to 200 parts copper per million parts acrylamide present as cupric salt dissolved in said concentrated solution and the pH value in said concentrated solution is maintained at pH5 or less.

4,163,756

DIRECT OXIMATION OF KETONES

John N. Armor, Morris Plains, N.J., assignor to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Apr. 11, 1978, Ser. No. 895,325

Int. Cl.[2] C07C *131/04, 131/00*

U.S. Cl. 260—566 A **8 Claims**

1. Direct process for production of oxime which comprises passing a mixture consisting essentially of a ketone, ammonia and oxygen in contact with a solid catalyst said catalyst having surface area of at least one and up to 900 square meters per gram, at temperature in the range of 50° C.–500° C., thereby producing oxime in recoverable form as a reaction product wherein the solid catalyst comprises silica, alumina, boron nitride, magnesia, zirconia, zinc oxide, or an oxide of a transition metal of Group 3–8 of the Periodic Table or mixtures thereof.

4,163,757

BASE MODIFIED CATALYSIS IN THE STYRENATION OF DIPHENYLAMINE

Richard M. D'Sidocky, Ravenna, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 840,440, Oct. 7, 1977, abandoned. Filed Nov. 13, 1978, Ser. No. 960,145

Int. Cl.[2] C07C *85/18*

U.S. Cl. 260—570 R **7 Claims**

1. An improved process for producing a styrenated diphenylamine comprising reacting diphenylamine and styrene in the presence of an acidic clay catalyst, wherein the improvement comprises modifying the acidic clay catalyst by the addition of a base to the system.

4,163,758

2-NITROETHYLCYCLOPENTANE COMPOUNDS AND PROCESS FOR PREPARING THE SAME

Kiyosi Kondo, Yamato; Daiei Tunemoto, and Teruo Umemoto, both of Sagamihara, all of Japan, assignors to Sagami Chemical Research Center, Tokyo, Japan

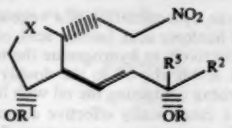
Filed Sep. 6, 1978, Ser. No. 939,937

Claims priority, application Japan, Sep. 9, 1977, 52-107863; Feb. 8, 1978, 53-12327

Int. Cl.[2] C07C *49/46*

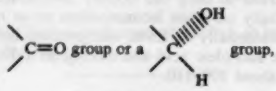
U.S. Cl. 260—586 R **3 Claims**

1. A 2-nitroethylcyclopentane compound represented by the formula (I)



(I)

wherein X represents a



R and R^1 each represents a hydrogen atom or a conventional protective group for a hydroxy group, R^2 represents an unsubstituted or substituted alkyl group having 1 to 8 carbon atoms where the substituents are —O— alkyl of 1–4 carbon atoms, —S— alkyl of 1–4 carbon atoms, phenoxy optionally substituted with a halogen atom or an alkyl group having 1–4 carbon atoms and R^5 represents a hydrogen atom or an alkyl group having 1 to 4 carbon atoms.

4,163,759

PROCESS FOR PREPARING AROMATIC HYDROXYALDEHYDES

Kurt Bauer, and Werner Steuer, both of Holzminden, Fed. Rep. of Germany, assignors to Haarmann & Reimer Gesellschaft mit beschrankter Haftung, Holzminden, Fed. Rep. of Germany

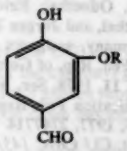
Continuation of Ser. No. 234,653, Mar. 14, 1972, abandoned. This application May 9, 1977, Ser. No. 795,359

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1971, 2115551

Int. Cl.[2] C07C *45/18*

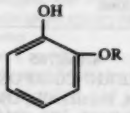
U.S. Cl. 260—600 A **12 Claims**

1. The process for the preparation of an aromatic hydroxyaldehyde of the formula

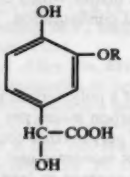


wherein

R is methyl or ethyl, which comprises condensing a phenol of the formula



with glyoxylic acid to produce a substituted glyoxylic acid of the formula



and oxidizing said substituted glyoxylic in aqueous acid at a pH at most 5 with an oxidizing agent having a redox potential in the range of from E=+0.17 to +1.84 volts wherein the oxidizing agent is potassium chlorate or sodium chlorate in admixture with copper, iron, cobalt or nickel sulphate or chloride, whereby the aromatic hydroxyaldehyde is produced in high yield based on starting phenol.

4,163,760

CONTINUOUS PRODUCTION OF ORGANIC PHOSPHINES

Georg Elsner, Hürth; Gero Heymer, Erftstadt, and Hans-Werner Stephan, Cologne, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Hürth Knapsack, Fed. Rep. of Germany

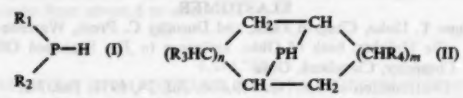
Filed Jan. 25, 1978, Ser. No. 872,250

Claims priority, application Fed. Rep. of Germany, Jan. 29, 1977, 2703802

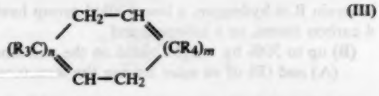
Int. Cl.[2] C07F 9/54

U.S. Cl. 260—606.5 P **12 Claims**

1. In a process for the continuous production of organic phosphines of the following general formula (I) or (II)



in which formula (I) R_1 and R_2 each are selected from the group consisting of an alkyl-, cycloalkyl- or aralkyl group having 2 to 18 carbon atoms, or one of the substituents R_1 and R_2 is a hydrogen atom and the other is one of the said groups, and in which formula (II) m and n each are 1, 2 or 3, the sum of m+n being at most 5, and R_3 and R_4, being identical or different, each are a hydrogen atom or an alkyl group having 1 to 6 carbon atoms, wherein the formula (I) compound is made by reacting an alkylene, cycloalkylene or aralkylene having 2 to 18 carbon atoms with hydrogen phosphide, or the formula (II) compound is made by reacting a compound of the following general formula (III)



(III)

in which m, n, R_3 and R_4 have the meanings given above, with hydrogen phosphide at elevated temperature and under elevated pressure in the presence of a free radical-yielding catalyst solution in an inert solvent, terminating the reaction and separating the resulting organic phosphine from the reaction mixture, the improvement which comprises: continuously supplying from above a pressure reactor, which is provided in its interior with mixing elements, kept free from oxygen, and subdivided so as to comprise an upper cooling zone and a lower reaction zone, with (a) a solution of the alkylene, cycloalkylene or aralkylene or of a compound of general formula (III) and the catalyst in an inert solvent, and (b) a stoichiometric excess of hydrogen phosphide, the said (a) and (b) reactants being supplied jointly with, but separately from, one another; mixing the said (a) and (b) reactants in the upper cooling zone of the reactor at a temperature of about 0° to 35° C. and under a PH_3-pressure of about 80 to 300 bars; reacting the resulting mixture, which travels downwardly in the reactor, in the lower reaction zone at about 90° to 190° C., the reactants being allowed to remain in the reactor for a period of time about 13 to 15 times longer than the half life period of the catalyst; removing the reaction mixture through the bottom portion of the reactor and, after pressure release to atmospheric, subjecting the mixture to distillation so as to separate the organic phosphines therefrom.

4,163,761

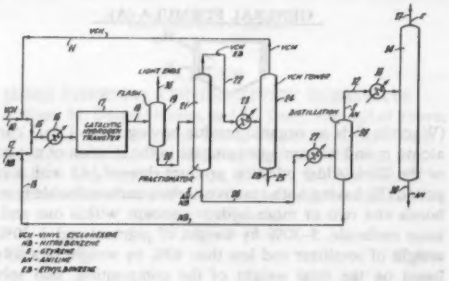
STYRENE PROCESS

John A. Patterson, Fishkill, N.Y.; Wheeler C. Crawford, Houston, and James R. Wilson, Missouri City, both of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Oct. 19, 1978, Ser. No. 952,763

Int. Cl.[2] C07C 15/00

U.S. Cl. 585—431 **6 Claims**



1. The method for preparing product stream containing styrene which comprises:

passing a charge stream containing vinyl cyclohexene and $R'NO_2$, wherein R' is alkyl, cycloalkyl, aralkyl, aryl, or alkaryl, into contact at 170°–360° C. with a catalytic amount of copper chromite as catalyst, thereby forming product stream containing styrene; and

withdrawing said product stream containing styrene.

4,163,762

BLENDS OF PHENOLPHTHALEIN POLYCARBONATES WITH RUBBER-MODIFIED MONOVINYLIDENE AROMATIC COPOLYMERS

John F. Rudd, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jun. 16, 1977, Ser. No. 806,990

Int. Cl.[2] C08L 67/00

U.S. Cl. 525—67 **9 Claims**

1. A heterogeneous blend comprising (1) from about 40 to about 90 weight percent of a copolycarbonate of from about 10 to about 60 weight percent of phenolphthalein and from about 90 to about 40 weight percent of a bis(hydroxyphenyl)alkylidene and (2) from about 60 to about 10 weight percent of a rubber-modified copolymer which comprises (a) a random copolymer containing copolymerized therein from about 50 to about 95 weight percent of styrene and from about 50 to about

5 weight percent of acrylonitrile, said random copolymer having a solubility parameter in the range from about 9.2 to about 11.2, and (b) a rubber containing sufficient conjugated diene to enable the rubber to form a graft copolymer with said random copolymer and (c) a graft copolymer containing the rubber grafted with a copolymerized mixture of the styrene and the acrylonitrile wherein the weight ratio of the rubber being grafted to the copolymerized mixture is from about 9:1 to about 0.2:1 and the ratio of styrene to acrylonitrile in the copolymerized mixture is from about 1:1 to about 19:1.

4,163,763

METHOD FOR PRODUCING CURABLE RESIN AND CURABLE COATING COMPOSITION

Shozo Tsuchiya, Tokyo; Hideo Hayashi; Makoto Sasaki, both of Yokohama; Kiyoshi Goto, and Toru Matsubara, both of Kyobashi, all of Japan, assignors to Nippon Oil Company, Limited, Tokyo, Japan

Filed Dec. 16, 1977, Ser. No. 861,198

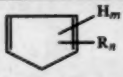
Claims priority, application Japan, Dec. 23, 1976, 51-154210

Int. Cl.[2] C08F *279/02*

U.S. Cl. 525—290 **2 Claims**

1. A curable coating composition comprising 30–80% by weight of a curable resin product of hydroxyl group-containing resin (I) esterified with acrylic acid and/or methacrylic acid, said resin (I) being a copolymerization product of a five-member cyclic compound having an unsaturated conjugated double bond representated by the general formula (A) given below;

GENERAL FORMULA (A):



(Wherein R is an organic residue having from 1 to 3 carbon atoms; m and n are integers and are in the relation of m+n=6) or the Diels-Alder addition product thereof (A) with a compound (B) having both reactive carbon-carbon double bond or bonds and two or more hydroxy groups within one and the same molecule, 5–30% by weight of pigment and 3–30% by weight of sensitizer and less than 40% by weight of a solvent based on the total weight of the composition, said solvent comprising one or a mixture of two or more of reactive monomers having double bond or bonds.

4,163,764

COUPLED BLOCK COPOLYMERS WITH IMPROVED TACK FOR ADHESIVES

Larry L. Nash, Borger, Tex., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jun. 23, 1977, Ser. No. 809,360

Int. Cl.[2] C08F *297/04*

U.S. Cl. 525—2 **28 Claims**

1. The process for the preparation of a coupled block copolymer which comprises the steps of polymerizing a first monomer selected from monovinyl aromatic hydrocarbons under solution polymerization conditions employing a hydrocarbon diluent, a first effective increment of a hydrocarbyllmonolithium initiator, at effective conditions of temperature, pressure, and time,

adding to the still-living polymerization admixture resulting therefrom at least one second monomer selected from conjugated dienes, together with a second effective increment of a hydrocarbyllithium initiator, provided that said second initiator increment is greater than said first initiator increment, and continuing said polymerization,

and thereafter treating the resulting polymerization admixture with an effective amount of a coupling agent which is at least difunctional, thereby producing a mixture of coupled block copolymers exhibiting effective properties in adhesive formulations.

4,163,765

POLYMERIC COMPOSITIONS

George A. Moczygemba, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 28, 1977, Ser. No. 855,490

Int. Cl.[2] C08F *297/04*

U.S. Cl. 525—314 **12 Claims**

1. A composition of matter which comprises a block polymer having the general configuration

$$(A—B'—C')_nZ$$

wherein A is a block of a polymerized monovinylarene monomer having 8 to 16 carbon atoms per monomer unit, B′ is a hydrogenated block of polymerized conjugated diene having 4 to 12 carbon atoms per monomer unit wherein said polymerized block has on the average at least one hydrocarbyl side chain branch for about every 10 carbon atoms of the polymeric backbone, C′ is a hydrogenated block of low vinyl polybutadiene wherein said hydrogenated block of low vinyl polybutadiene is produced from a non-hydrogenated low vinyl polybutadiene block with a vinyl content of no more than about 15 mol percent, n is an integer of from 2 to 4, and Z is the residue of a polyfunctional initiator when n=2 to 4, or the residue of a polyfunctional coupling agent when n=2 to 4, or a covalent chemical bond when n=2 and wherein said polymonovinylarene block A is 10 to 60 weight percent of the total polymer, said hydrogenated branched conjugated diene block B′ is 10 to 80 weight percent of the total polymer, and said hydrogenated low vinyl polybutadiene block C′ is 5 to 60 weight percent of the total polymer and wherein said hydrogenated polymer has a weight average molecular weight ranging from about 5,000 to about 1,000,000 and wherein from about 10 percent to about 100 percent of the unsaturation in each of the blocks B′ and C′ has been removed by hydrogenation.

4,163,766

IMPACT-RESISTANT OLEFINIC-NITRILE OLEFINIC-ESTER COPOLYMERS PREPARED IN THE PRESENCE OF AN OLEFINIC-ESTER COPOLYMER ELASTOMER

June T. Duke, Chagrin Falls, and Dorothy C. Prem, Warrensville Heights, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Continuation of Ser. No. 709,536, Jul. 28, 1976, Pat. No. 4,127,614, which is a continuation-in-part of Ser. No. 361,170, May 17, 1973, abandoned. This application Jun. 19, 1978, Ser. No. 916,978

Int. Cl.[2] C08L *33/00*

U.S. Cl. 525—230 **9 Claims**

1. The polymer resulting from the polymerization of 100 parts by weight of

(A) at least 70% by weight of at least one nitrile monomer having the structure

$$CH_2=\underset{\displaystyle R}{\underset{|}{C}}—CN$$

wherein R is hydrogen, a lower alkyl group having from 1 to 4 carbon atoms, or a halogen, and

(B) up to 30% by weight based on the combined weights of (A) and (B) of an ester having the structure

$$CH_2=\underset{\displaystyle R_1}{\underset{|}{C}}—COOR_2$$

wherein R_1 is hydrogen, an alkyl group having from 1 to 4 carbon atoms, or a halogen, and R_2 is an alkyl group having from 1 to 6 carbon atoms or an epoxy or oxirane group having from 2 to 6 carbon atoms

in the presence of from 1 to 40 parts by weight of

(C) an elastomer selected from the group consisting of a copolymer of ethyl acrylate and acrylonitrile, a copolymer of ethyl acrylate and styrene, and a copolymer of n-butyl acrylate and styrene.

4,163,767

POLYALKYLENE GLYCOL ALKYL POLYPHOSPHITES

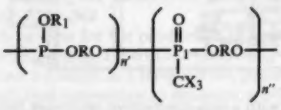
Silvio L. Giolito, Whitestone, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Continuation-in-part of Ser. No. 611,469, Sep. 8, 1975, abandoned, which is a continuation of Ser. No. 483,606, Jun. 27, 1974, Pat. No. 3,986,990, which is a continuation of Ser. No. 322,595, Jan. 10, 1973, abandoned, which is a continuation-in-part of Ser. No. 166,295, Jul. 26, 1971, abandoned. This application Jan. 30, 1978, Ser. No. 873,468

Int. Cl.[2] C07F *9/08*; C08J *9/00*

U.S. Cl. 260—929 **4 Claims**

1. A polyphosphorous mixed phosphite-phosphonate polymer flame retardant having an OH number less than one and containing both alkyl phosphite and haloalkyl phosphonate linkages, said polyphosphorus polymer represented by the formula:



where R_1 is alkyl; R is a polyalkylene glycol residue defined as that portion derived from a polyalkylene glycol having the formula:

$$HO\text{-}(R''O)_m H$$

wherein R'' is an alkylene group of from 2 to about 20 carbon atoms, and m designates the number of repeating alkylene ether units and is from 2 to 20; X is a halogen; and n' and n'' are numbers such that the sum of n' and n'' is an integer in the range from about 4 to about 50.

4,163,768

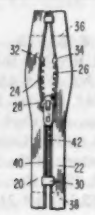
METHOD OF MANUFACTURING MOLDED TOP STOP

Milton L. Stephens, Meadville, Pa., assignor to Textron Inc., Providence, R.I.

Division of Ser. No. 599,516, Jul. 28, 1975, Pat. No. 4,034,445. This application May 27, 1977, Ser. No. 801,309

Int. Cl.[2] B29D *5/00*; B06B *3/00*

U.S. Cl. 264—23 **3 Claims**



1. A method of forming a top stop on a slide fastener comprising the steps of

placing the slide fastener upon an anvil surface on top of a die having a channel for receiving and positioning a beaded portion and a fastening element portion of the slide fastener and below a horn tip having a channel for receiving and positioning the beaded portion and fastening element portion,

severing a block of thermoplastic material from a strip of thermoplastic material,

moving the severed block of thermoplastic material into engagement with one side of at least one top fastening element and an inner edge of one tape of the slide fastener,

said severing and moving steps including the utilization of a punch and mating opening in the die for severing the block of thermoplastic material and for moving the block through the opening into engagement with the one side of the one top fastening element and tape inner edge,

engaging the opposite side of the top fastening element and the inner edge of the one tape with a horn tip,

molding the severed and moved block of thermoplastic material around the one fastening element and on the one side of the one tape,

trimming extra fastening elements extending above the one fastening element simultaneously with said molding by means of a trimming edge on the horn tip,

said molding and trimming steps including the utilization of a trimming edge on the horn tip contoured to trim fastening elements from the one tape above the one fastening element,

said molding and trimming steps also including applying ultrasonic energy to the horn tip, and

guiding the beaded portion and fastening element portion into said channels during said engaging step by means of a beveled side surface on the trimming edge.

4,163,769

HIGH THERMAL CONDUCTIVITY SUBSTRATE

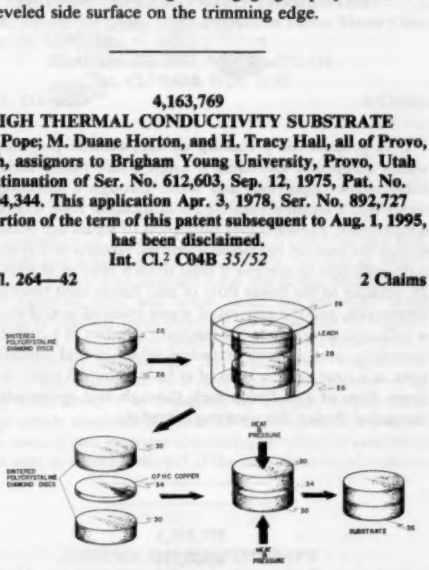
Bill J. Pope; M. Duane Horton, and H. Tracy Hall, all of Provo, Utah, assignors to Brigham Young University, Provo, Utah

Continuation of Ser. No. 612,603, Sep. 12, 1975, Pat. No. 4,104,344. This application Apr. 3, 1978, Ser. No. 892,727

The portion of the term of this patent subsequent to Aug. 1, 1995, has been disclaimed.

Int. Cl.[2] C04B *35/52*

U.S. Cl. 264—42 **2 Claims**



1. A method of making a high thermal conductivity substrate for use as a heat sink comprising the steps of:

combining diamond particles with at least one diamond flat in a sample chamber and orienting the flat parallel to the longitudinal axis of the chamber so as to increase the thermal conductivity of the resulting substrate;

sintering the combination of diamond particles and the diamond flat under elevated temperature and pressure conditions until a unitary polycrystalline diamond composite is formed; and

leaching the graphite from the diamond composite so as to remove undesirable electrical conductivity properties of the composite.

4,163,770

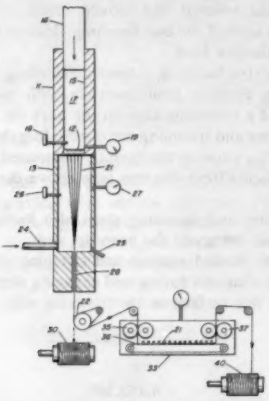
MELT-SPINNING ACRYLONITRILE POLYMER FIBERS

Harold Porosoff, Scarsdale, N.Y., assignor to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 803,005, Jun. 3, 1977, abandoned, which is a continuation-in-part of Ser. No. 698,566, Jun. 22, 1976, abandoned, which is a continuation-in-part of Ser. No. 349,877, Apr. 10, 1973, abandoned, which is a division of Ser. No. 344,463, Mar. 23, 1973, abandoned, which is a continuation-in-part of Ser. No. 337,506, Mar. 2, 1973, abandoned, which is a continuation-in-part of Ser. No. 329,479, Feb. 5, 1973, abandoned. This application Aug. 30, 1978, Ser. No. 938,200

Int. Cl.[2] D01F 7/00

U.S. Cl. 264—210.3 6 Claims



1. A process for preparing an acrylonitrile polymer fiber which comprises: extruding a single phase fusion melt of an acrylonitrile copolymer and water through a spinnerette directly into a steam-pressurized solidification zone wherein the temperature, pressure, and saturation of steam are maintained so that the nascent extrudate solidifies, remains in a stretchable state sufficient to achieve a total stretch ratio of at least about 25, relative to the linear flow of said fusion melt through said spinnerette, and the amount of water retained in said extrudate is sufficient to maintain the nascent extrudate in a plastic state; stretching said nascent extrudate while in said solidification zone at a total stretch ratio of at least about 25 relative to the linear flow of said fusion melt through said spinnerette; and thereafter drying the resulting extrudate.

4,163,771

HYDROXYALKYLAMINOALKYLAMIDES AS CORROSION INHIBITORS FOR METALS IN AN AQUEOUS BRINE ENVIRONMENT

Derek Redmore, Ballwin, and Benjamin T. Outlaw, Webster Groves, both of Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Division of Ser. No. 684,711, May 10, 1976, Pat. No. 4,060,553. This application Jul. 11, 1977, Ser. No. 814,253

Int. Cl.[2] C23F 11/10, 11/14

U.S. Cl. 422—16 19 Claims

1. A process of inhibiting corrosion of metals in a corrosive aqueous medium containing brine which comprises incorporating into said corrosive medium from about 10 p.p.m. to about 10,000 p.p.m. of (1) the products produced by reacting about 1 mole of an unsaturated nitrile of the formula

$$R'-CH=\underset{\displaystyle R''}{\overset{\displaystyle |}{C}}-CN$$

wherein R′ and R″ are hydrogen or alkyl, aryl, cycloalkyl, alkaryl, and aralkyl with about 3 moles of an alkanolamine which comprises mixing said nitrile and alkanolamine and then heating said mixture at a temperature and for a time so that one mole of the alkanolamine reacts with the unsaturated group to form an N-alkanol group and the other 2 moles of the alkanolamine react with the nitrile group to form an hydroxyalkylaminoalkylamide group, or (2) quaternaries thereof.

4,163,772

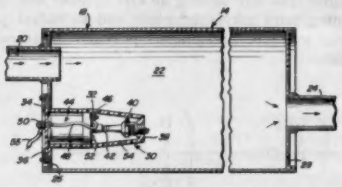
AIR CHARGER

William R. Brown, 1018 W. Jackson St., Muncie, Ind. 47305

Filed Aug. 2, 1977, Ser. No. 821,324

Int. Cl.[2] F01N 3/14; F23G 7/06

U.S. Cl. 422—108 8 Claims



1. In combination with a non-conductive enclosure having a chamber through which a flow of electrically grounded combustion products is conducted to atmosphere, exhaust treating means connected to said enclosure, comprising d.c. voltage means, a spark plug mounted on said enclosure and projecting into the chamber, an ignition coil device connecting the d.c. voltage means to the spark plug, means responsive to said flow of said combustion products through the chamber for inducing a restricted inflow of moisture laden externally ambient air into the chamber to produce a gaseous mixture therein of varying electrical conductivity, and terminal means connected to said ignition coil device for inducing a spark generating voltage in the ignition coil device as a result of said varying electrical conductivity causing discharges from the spark plug within the chamber, said ignition coil device including primary and secondary windings connected to the d.c. voltage means, said primary winding having a low voltage terminal connected to the terminal means, said terminal means being exposed to the grounded combustion products in the chamber, said secondary winding having a high voltage terminal connected to the spark plug.

4,163,773

SELF-CLINKERING BURNING RATE MODIFIER FOR SOLID PROPELLANT NF_3-F_2 GAS GENERATORS FOR CHEMICAL HF-DF LASERS

Karl O. Christe, Calabasas, and Carl J. Schack, Chattsworth, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 18, 1978, Ser. No. 970,775

Int. Cl.[2] C01B 21/18

U.S. Cl. 423—351 2 Claims

1. $N_2F_3SnF_5$.

2. A method for preparing $N_2F_3SnF_5$ comprising the steps of:

forming a solution of $N_2F_3SbF_6$ salt and Cs_2SnF_6 salt in HF; allowing the salts to react.

4,163,774

$N_2F_3SBF_6$ AND ITS PREPARATION

Carl J. Schack, Chattsworth, and Karl O. Christe, Calabasas, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 27, 1978, Ser. No. 964,025
Int. Cl.[2] C01B *21/18*
U.S. Cl. 423—351 3 Claims

1. The salt having the formula:

$N_2F_3SbF_6$.

2. A method for preparing the salt having the formula $N_2F_3SbF_6$ comprising the steps of:

forming a solution of N_2F_4 and SbF_5 in anhydrous HF; and reacting the N_2F_4 and SbF_5 at room temperature.

4,163,775

PROCESS FOR THE SYNTHESIS OF AMMONIA USING CATALYSTS SUPPORTED ON GRAPHITE CONTAINING CARBON

Alan I. Foster, Ashford; Peter G. James, Sunbury-on-Thames; John J. McCarroll, Camberley, and Stephen R. Tennison, Weybridge, all of England, assignors to The British Petroleum Company Limited, Sunbury-on-Thames, England

Filed Oct. 31, 1977, Ser. No. 847,075
Claims priority, application United Kingdom, Nov. 3, 1976, 45711/76
Int. Cl.[2] C01C *1/04;* B01J *23/58, 21/18*
U.S. Cl. 423—363 2 Claims

1. A process for the production of ammonia which process comprises passing a feedstock containing nitrogen and hydrogen over a catalyst at a temperature, pressure and space velocity such that conversion to ammonia is effected, said temperature being in the range 250°–600° C.; said pressure being in the range atmospheric to 300 bars(ga); and, said space velocity being in the range 1,000 to 100,000 v/v/hr, said catalyst comprising (i) as support a graphite-containing carbon having (a) a basal plane surface area of at least 100 m^2/g, (b) a ratio of BET surface area to basal plane surface area of not more than 8:1 and (c) a ratio of basal plane surface area to edge surface area of at least 2:1 and (ii) as active component (a) 0.1 to 50% by weight of a transition metal of the 4th, 5th and 6th horizontal Periods of Groups VB, VIB, VIIB and VIII of the Periodic Table, and (b) 0.1 to 4 times by weight of (a) of a modifying metal ion selected from Groups IA or IIA of the Periodic Table of the lanthanides or actinides, the modifying metal ion being actively associated with the transition metal rather than the support.

4,163,776

PROCESS FOR STACK GAS DESULFURIZATION

Metro D. Kulik, Pittsburgh, Pa., and Everett Gorin, San Rafael, Calif., assignors to Continental Oil Company, Stamford, Conn.

Filed Dec. 5, 1978, Ser. No. 966,687
Int. Cl.[2] C01B *17/04*
U.S. Cl. 423—567 8 Claims

1. A method for removing sulfur oxides from a gaseous mixture, said method comprising:

(a) contacting said gaseous mixture in a first zone with an aqueous solution containing $(NH_4)_2S_2O_3$ at a pH below about 5.5 to produce at least one compound selected from the group consisting of $(NH_4)_2S_3O_6$ and $H_2S_3O_6$;

(b) contacting said gaseous mixture in a second zone with an aqueous solution containing at least one compound selected from the group consisting of ammonia and ammonium thiosulfate at a pH from about 5.5 to about 8.0 to produce at least one compound selected from the group consisting of $(NH_4)_2SO_3$ and $(NH_4)HSO_3$ and remove sulfur oxides from said gaseous mixture;

(c) contacting said gaseous stream in a third zone with an aqueous stream containing at least one compound selected from the group consisting of $(NH_4)_2S_2O_3$, $(NH_4)_2S_3O_6$ and $H_2S_3O_6$ at a pH below about 5.5 to recover NH_3 from said gaseous stream;

(d) withdrawing a stream of said aqueous solution containing at least one compound selected from the group consisting of $(NH_4)_2S_2O_3$, $(NH_4)_2S_3O_6$ and $H_2S_3O_6$ from said first zone;

(e) passing at least a portion of said stream from said first zone to said third zone;

(f) passing at least a portion of said stream from said first zone to sulfur recovery;

(g) withdrawing at least a portion of said aqueous solution containing at least one compound selected from the group consisting of $(NH_4)_2SO_3$ and $(NH_4)HSO_3$ from a lower portion of said second zone;

(h) adding NH_3 and at least one sulfide compound selected from the group consisting of $(NH_4)_2S$, $(NH_4)HS$, ammonium polysulfide, and H_2S to said portion of said aqueous solution withdrawn from said second zone to produce said aqueous solution containing at least one compound selected from the group consisting of ammonia and ammonium thiosulfate;

(i) passing said aqueous solution containing at least one compound selected from the group consisting of ammonia and ammonium thiosulfate to an upper portion of said second zone.

4,163,777

CONTROLLED ANTACID DELIVERY FORM AND METHOD OF TREATMENT THEREWITH

Arun K. Mitra, St. Louis, Mo., assignor to Lewis/Howe Company, St. Louis, Mo.

Filed Apr. 29, 1977, Ser. No. 792,101
Int. Cl.[2] A61K *9/24, 9/22*
U.S. Cl. 424—21 4 Claims

1. A noncariogenic controlled antacid delivery composition compressed into lozenges having a hardness of at least 15 kg/in^2, including a mixture of a magnesium antacid salt and an aluminum antacid salt, said salts having different rates of reaction with hydrochloric acid, in a matrix including in combination mannitol, a gel-forming swelling agent selected from the group consisting of sodium carboxymethyl cellulose and xanthum gum, and a hydrophobic magnesium, calcium or aluminum salt of a fatty acid selected from the group consisting of stearic, palmitic, oleic and lauric acids, the mannitol being present in an amount from about 25 to 60 percent by weight, the gel forming agent being present in an amount from about 3 to 10 percent by weight, and the hydrophobic magnesium, calcium or aluminum salt of a fatty acid being present in an amount from about 1 to 5 percent by weight, to provide a lozenge which dissolves in about 15 to 60 minutes in a user's mouth, each of said lozenges containing an effective amount of antacid salts to maintain the pH of the user's gastric juice above 3.5.

4,163,778

ASTHMA IMMUNOTHERAPY

John L. Ohman, Natick, and Francis C. Lowell, Concord, both of Mass., assignors to The Foundation for the Study of Asthma and Related Diseases, Boston, Mass.

Filed May 4, 1978, Ser. No. 903,025
Int. Cl.[2] A61K *35/36, 39/00*
U.S. Cl. 424—91 5 Claims

1. A process for reducing the bronchial sensitivity to cat dander exposure of a patient who experiences asthmatic symptoms on exposure to cat, said process comprising the steps of subcutaneously injecting the patient with an extract of cat dander and repeating the injection with extracts of increasing cat allergen content for a sufficient number of times to reduce bronchial sensitivity, wherein the improvement comprises

employing as an extract a preparation made from cat pelts having a total nondialyzable solids content comprising at

least 10% by weight cat allergen 1, and containing at least 300 micrograms per milliliter of cat allergen 1,

said cat allergen 1 consisting essentially of a protein having a molecular weight between 30,000 and 60,000 daltons and being identifiable by its ability to form a precipitin line with allergen 1 antiserum purified by absorption with cat albumin.

4,163,779

TEST FOR QUANTITATION OF IMMUNOGLOBULIN AND IDENTIFICATION OF ABNORMAL IMMUNOGLOBULIN

Richard A. Harte, Redwood City, and Fred H. Deindoerfer, Santa Clara, both of Calif., assignors to International Diagnostic Technology, Inc., Santa Clara, Calif.

Filed Jan. 9, 1978, Ser. No. 868,189

Int. Cl.[2] **G01N** *33/16*; **A61K** *39/00, 43/00*

U.S. Cl. 424—1 **5 Claims**

1. The method of determining the presence of clinically significant quantities of abnormal homogeneous immunoglobulin in liquid human serum sample which comprises

I. (a) sorbing immunoglobulin from a first fraction of said serum onto an immunological unreactive solid sorptive surface, and then

(b) contacting said sorptive surface with an aqueous reagent containing an excess of labeled antibody specifically reactive with sample immunoglobulin,

(c) washing said sorptive surface,

(d) measuring the quantity of labeled antibody held on said surface,

II. (a) sorbing normal heterogeneous immunoglobulin onto a second immunologically unreactive solid sorptive surface,

(b) mixing an excess of labeled antibody specifically reactive with sample immunoglobulin with a second fraction of said serum,

(c) contacting the solid support surface from IIa with a mixture of IIb, then

(d) washing said second surface,

(e) measuring the quantity of labeled antibody held on said second surface;

(f) determining the ratio of the measurements obtained in steps IIe and Id, a ratio in excess of 2:1 being indicative of the presence of clinically significant quantities of abnormal immunoglobulin in the serum sample.

4,163,780

KS-2-A

Nakao Ishida; Fujio Suzuki, both of Sendai; Hiroshi Maeda, Kumamoto; Toshikatsu Fujii, Gotenba, and Ituro Mizutani, Numazu, all of Japan, assignors to Kirin-Seagram Limited, Tokyo, Japan

Filed Mar. 30, 1978, Ser. No. 891,767

Claims priority, application Japan, Mar. 30, 1977, 52/35944; Sep. 6, 1977, 52/106321

Int. Cl.[2] **A61K** *35/00*

U.S. Cl. 424—116 **4 Claims**

1. KS-2-A having the following physicochemical properties:

(1) Elemental analysis

C: 39.5%, H: 6.5%, N: 1.1%,

Ash: trace (0.4%);

(2) Molecular weight

9,000±3,000 (by ultra-filtration),

7,000 to 9,000 (by equilibrium density gradient centrifugation),

8,000±3,000 (by fluorescein polarization method);

(3) Appearance

amorphous white powder;

(4) Decomposition point

185° C. (based upon measurement of the browning temperature by capillary method using "Silicone Oil WF-30");

(5) UV spectrum

No particular maximal absorption is observed as shown in FIG. 1;

(6) IR spectrum

The spectrum is shown in FIG. 2;

(7) The pH of the aqueous solution of this substance is 7.25;

(8) Solubility

Soluble in water, insoluble in ethanol, acetone, n-hexane, n-butanol, phenol and other organic solvents;

(9) Specific optical rotation

$[\alpha]_D^{25} = +67.5° \pm 2.0°$ (in H_2O), (C=0.452%);

(10) Homogeneity

a. The result of centrifugation in a linear gradient of 5 to 20% of CsCl in 0.1 M Tris-CHl buffer (pH 7.2) at 38,000 r.p.m., at 4° C. for 15 hours is shown in FIG. 3, the substance being homogeneous as is apparent from the Figure; comparative sedimentation experiments with viral nucleic acids show that the substance does not contain viral particles, RNA or DNA;

b. The substance is electrophoretically homogeneous as is shown in FIG. 4 which shows the results of electrophoresis on cellulose acetate using 0.1 M acetic acid/pyridine buffer (pH 3.5), chondroitin sulfate being used as control; after 30 minutes of electrophoresis at 0.6 mA/cm and 160 V, chondroitin sulfate moves to the cathode, giving a mobility of 4 cm per 30 minutes, whereas KS-2-A moves slightly to the anode in 90 minutes (a mobility of 1 cm per 90 minutes); the substance is also shown to be homogeneous by electrophoresis conducted under the same conditions as above except using 1 M pyridine/acetic acid buffer (pH 7.0);

(11) Color reaction

Phenol-H_2SO_4 reaction: Positive

Anthrone reaction: Positive

Molisch's reaction: Positive

Elson-Morgen reaction: Negative

Carbazole-H_2SO_4 reaction: Positive

Reaction with Folin-Ciocarteu reagent: Positive

Biuret reaction: Positive

Reaction with FITC (fluorescein isothiocyanate): Positive

Toluidin blue O staining: Negative

Ninhydrin reaction: Positive;

(12) Sugar composition

FIG. 5 shows the results of subjecting the substance to acid hydrolysis, followed by alditolation and then acetylation, and then determining the sugar composition by gas chromatography; the substance is mainly composed of mannose and contains small quantities of glucose and galactose and also minute quantities of arabinose and xylose, the proportions of these components by weight being 74:12:12:1:1; and

(13) Amino acid composition

Amino acid analysis, made in an automatic amino acid analyzer after closing 10 mg of the substance in vacuo together with 3 ml of 6 N HCl, subjecting it to acid hydrolysis at 110° C. for 22 hours and then removing by a rotary evaporator shows that the amino acids contained are mainly threonine, serine, glutamic acid, alanine and ammonia, and further slight quantities of aspartic acid, proline, glycine, valine and lysine are contained; further, sometimes trace amounts of methionine, isoleucine leucine, tyrosine, phenylalanine, histidine, arginine and cystine are recognized.

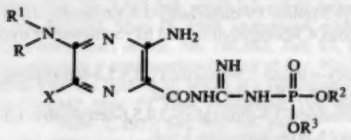
4,163,781

3-AMINO-N-[(PHOSPHONOAMINO)IMINOMETHYL]-6-HALOPYRAZINECARBOXAMIDE COMPOUNDS, COMPOSITIONS AND METHODS OF USE

Edward J. Cragoe, Jr., Lansdale, and Otto W. Woltersdorf, Jr., Chalfont, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Apr. 17, 1978, Ser. No. 896,876
Int. Cl.[2] A61K *31/675;* C07D *241/32*
U.S. Cl. 424—200 9 Claims

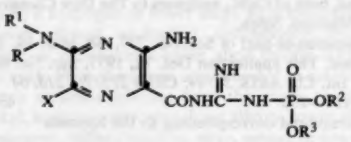
1. A compound of the formula



wherein

R is hydrogen, lower alkyl, lower alkenyl or lower alkynyl;
R^1 is hydrogen, lower alkyl, lower alkenyl or lower alkynyl;
R^2 is hydrogen, lower alkyl, benzyl or alkali metal;
R^3 is hydrogen, lower alkyl, benzyl or alkali metal; and
X is halogen.

8. A method of treating edema and/or hypertension which comprises administering to a patient a pharmacologically acceptable dose of a compound of the formula:



wherein

R is hydrogen, lower alkyl, lower alkenyl or lower alkynyl;
R^1 is hydrogen, lower alkyl, lower alkenyl or lower alkynyl;
R^2 is hydrogen, lower alkyl, benzyl or alkali metal;
R^3 is hydrogen, lower alkyl, benzyl or alkali metal; and
X is halogen.

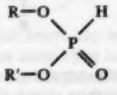
4,163,782

FUNGICIDAL COMPOSITIONS CONTAINING DISUBSTITUTED PHOSPHONATES

André Thizy, Ecully, and Jean-Claude Debourge, Lyon, both of France, assignors to Philagro, France

Continuation of Ser. No. 799,784, May 23, 1977, abandoned, which is a continuation of Ser. No. 555,293, Mar. 4, 1975, abandoned. This application Sep. 12, 1978, Ser. No. 941,377
Claims priority, application France, Mar. 8, 1974, 74 08995
Int. Cl.[2] A01N *9/00, 9/36*
U.S. Cl. 424—217 10 Claims

1. A method of controlling plant fungus which comprises applying to said fungus a fungicidally effective amount of a composition containing as an active fungicidal ingredient at least one compound of the formula



in which R and R′ may be the same or different and each represents a linear or branched alkyl radical of 1 to 4 carbon atoms, optionally interrupted by an oxygen atom; phenyl; tetrahydrofurfuryl or cyclohexyl radical, in combination with an agriculturally acceptable vehicle.

4,163,783

SYNERGISTIC COMPOSITIONS AND METHOD OF USE TO TREAT INFLAMMATION

Robert W. Klein, 1013 Union Meeting Rd., Blue Bell, Pa. 19422, and George W. Nuss, Jr., 1505 Taylor Rd., Lansdale, Pa. 19446

Continuation-in-part of Ser. No. 835,595, Sep. 22, 1977. This application May 1, 1978, Ser. No. 901,573
The portion of the term of this patent subsequent to May 1, 1996, has been disclaimed.
Int. Cl.[2] A61K *31/44, 31/555*
U.S. Cl. 424—245 2 Claims

1. A method of treating inflammation in warm blooded animals which comprises topically administering to a warm blooded animal in need of such treatment an effective amount of a non-steroidal agent having anti-inflammatory activity selected from the group consisting of 1-(p-chlorobenzoyl)-5-methoxy-2-methylindole-3-acetic acid, d-2-(6-methoxy-2-naphthyl)propionic acid, 1-methyl-5-(4-methylbenzoyl-1)H-pyrrole-2-acetic acid, α-methyl-4-(2-methylpropyl)benzeneacetic acid, 4-(2-methylpropyl)benzeneacetic acid, α-methyl-3-phenoxybenzeneacetic acid, α,3-dichloro-4-cyclohexylphenylacetic acid, 2′,4′-difluoro-4-hydroxy-3-biphenylcarboxylic acid and bis-2-(pyridyl-1-oxide) disulfide, said non-steroidal agent being present in the amount of 1–40% by weight of said bis-(2-pyridyl-1-oxide) disulfide.

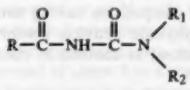
4,163,784

HETEROCYCLYLCARBONYL DERIVATIVES OF UREA, AGENTS FOR DISSOLUTION OF GALLSTONES

Gerald F. Holland, Old Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

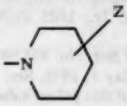
Filed Mar. 9, 1978, Ser. No. 884,858
Int. Cl.[2] A61K *31/54, 31/535, 31/44*
U.S. Cl. 424—246 10 Claims

1. A method of dissolving cholesterol gallstones in a mammal which comprises administering to the mammal a cholesterol gallstone dissolving amount of a compound having the formula



wherein R is selected from the group consisting of
pyridyl,
chloro substituted pyridyl,
quinolyl,
furyl,
5-methyl-3-isoxazolyl,
3-methyl-5-isoxazolyl,
3-methyl-5-isothiazolyl,
4-methyl-5-thiazolyl,
4-methyl-5-oxazolyl,
5-methyl-3-phenyl-4-isoxazolyl,
isothiazolyl,
3-(1,2,5-thiadiazolyl),
4-(1,2,3-thiadiazolyl),
3-(1,2-benzisothiazolyl) and
thiazolyl:
R_1 is selected from the group consisting of hydrogen, alkyl having from one to ten carbon atoms and phenyl;
R_2 is selected from the group consisting of R_1, 1-naphthyl and phenylalkyl wherein the alkyl has from one to four carbon atoms;
R_1 and R_2 when taken together with the nitrogen to which they are attached are selected from the group consisting of
morpholino,
thiomorpholino,
1-(1,2,3,6-tetrahydropyridyl),
1-azacycloheptyl,

1-azacyclooctyl,
3-(2,3,4,5-tetrahydro-3,1-benzazepinyl) and



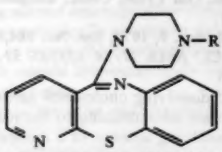
wherein Z is selected from the group consisting of hydrogen, alkyl having from one to four carbon atoms, alkoxy having from one to four carbon atoms, chloro and phenylalkyl having from one to four carbon atoms in the alkyl group, and the pharmaceutically acceptable acid addition salts of those compounds wherein R is a basic group.

4,163,785
BENZOTHIAZEPINE COMPOUNDS AND COMPOSITIONS

Charles Hoffmann, Fourqueux, and Etienne Bouley, Francon-ville, both of France, assignors to Hexachimie, Malmaison, France

Filed Apr. 3, 1978, Ser. No. 892,647
Claims priority, application United Kingdom, Apr. 7, 1978, 14692/78
Int. Cl.[2] A61K *31/495;* **C07D** *513/14*
U.S. Cl. 424—250 **3 Claims**

1. A compound of the formula



in which R is a hydrogen atom or alkyl of 1 to 5 carbon atoms, or a non-toxic acid addition salt thereof.

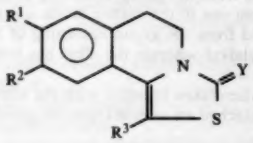
3. A therapeutic composition having antihistaminic, orexigenic and antianaphylaxic activity, comprising an effective amount of a compound as claimed in claim 1 and a carrier therefor.

4,163,786
THIAZOLOISOQUINOLINES WITH CORONARY AND RESPIRATORY EFFECTS

Kalmán Harsanyi; Kalmán Takacs; Pál Kiss, all of Budapest; László Szekeres; Gyula Papp, both of Szeged, and Eva Benedek, Győr, all of Hungary, assignors to Chinoin Pharmaceutical and Chemical Works Ltd., Budapest, Hungary

Continuation of Ser. No. 701,084, Jun. 30, 1976, abandoned, which is a continuation-in-part of Ser. No. 473,918, May 28, 1974, Pat. No. 3,979,397. This application Jan. 16, 1978, Ser. No. 869,791
Claims priority, application Hungary, May 30, 1973, CI 1381
Int. Cl.[2] C07D *513/04;* **A61K** *31/47*
U.S. Cl. 421—258 **6 Claims**

1. A compound of the formula:



or a pharmaceutically acceptable salt thereof wherein
R^1 and R^2 are methoxy;
R^3 is hydrogen, methyl, nitro, phenyl, carboxy or carboxamido; and
Y is imino, oxo, sulfo, N-p-chlorophenylimino, acetimino, benzolylimino, or N-2-hydroxyethylimino.

2. The compound defined in claim 1 selected from the group consisting of:
3-imino-8,9-dimethoxy-3,4,5,6-tetrahydro-1,3-thioazolo (4,3a)iso-quinoline, or its rhodanide and hydrochloride;
1-carboxamido-3-imino-3,4,5,6-tetrahydro-3,9-dimethoxy-1,3-thiazolo(4,3a)isoquinoline;
1-methyl-3-imino-3,9-dimethoxy-3,4,5,6-tetrahydro-1,3-thiazolo(4,3a)isoquinoline and its rhodanide;
1-phenyl-3-imino-3,9-dimethoxy-3,4,5,6-tetrahydro-1,3-thiazolo(4,3a)isoquinoline and its rhodanide or hydrochloride;
1-carboxy-e-imino-3,9-dimethoxy-3,4,5,6-tetrahydro-1,3-thiazolo(4,3a)isoquinoline; and
1-carboxamido-3,9-dimethoxy-3,4,5,6-tetrahydro-1,3-thioazolo(4,3a)isoquinoline-3-one.

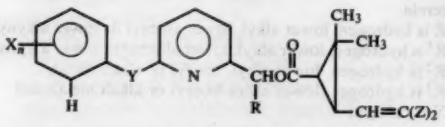
6. An antianginal composition for human or veterinary therapeutics containing as active ingredient an effective amount of the compound defined in claim 2 or a pharmaceutically acceptable salt thereof.

4,163,787
SUBSTITUTED PYRIDINE METHYL ESTERS OF CYCLOPROPANE CARBOXYLIC ACIDS AND THEIR USE AS INSECTICIDES

Sudarshan K. Malhotra, Walnut Creek, and Michael J. Ricks, Oakland, both of Calif., assignors to The Dow Chemical Company, Midland, Mich.

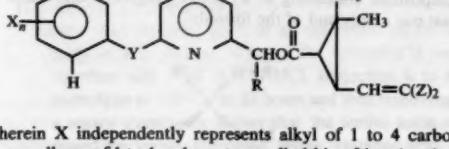
Continuation-in-part of Ser. No. 777,188, Mar. 14, 1977, abandoned. This application Dec. 12, 1977, Ser. No. 859,908
Int. Cl.[2] A61K *31/44;* **C07D** *213/70, 213/64*
U.S. Cl. 424—263 **45 Claims**

1. A compound corresponding to the formula



wherein X independently represents alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, alkylthio of 1 to 4 carbon atoms, alkylsulfonyl of 1 to 4 carbon atoms, trifluoromethyl, 3,4-methylenedioxy, chloro, fluoro or bromo; n represents an integer of 0 to 2; Y represents oxygen or sulfur; R represents hydrogen, cyano or ethynyl and Z represents chloro, fluoro or bromo.

31. A method for the kill and control of insects which comprises contacting said insects or their habitat with a composition containing as the active ingredient, an insecticidally effective amount of a compound corresponding to the formula



wherein X independently represents alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, alkylthio of 1 to 4 carbon atoms, alkylsulfonyl of 1 to 4 carbon atoms, trifluoromethyl, 3,4-methylenedioxy, chloro, fluoro or bromo; n represents an integer of 0 to 2; Y represents oxygen or sulfur; R represents hydrogen, cyano or ethynyl and Z represents chloro, fluoro or bromo, in intimate admixture with an inert carrier therefor.

4,163,788
TERTIARY AMINOACIDS

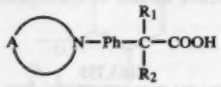
Richard W. J. Carney, New Providence, and George de Stevens, Summit, both of N.J., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 307,293, Nov. 16, 1972, which is a continuation-in-part of Ser. No. 181,564, Sep. 17, 1971, Pat. No. 3,767,805, which is a continuation-in-part of Ser. No. 40,436, May 25, 1970, abandoned, which is a continuation-in-part of Ser. No. 8,406, Feb. 3, 1970, abandoned, which is a continuation-in-part of Ser. No. 856,154, Sep. 8, 1969, abandoned, which is a continuation-in-part of Ser. No. 843,244, Jul. 18, 1969, Pat. No. 3,641,040, which is a continuation-in-part of Ser. No. 808,343, Mar. 18, 1969, abandoned, which is a continuation-in-part of Ser. No. 790,863, Jan. 13, 1969, abandoned, which is a continuation-in-part of Ser. No. 757,136, Sep. 3, 1968, Pat. No. 3,657,230, which is a continuation-in-part of Ser. No. 716,347, Mar. 27, 1968, abandoned. This application Nov. 7, 1977, Ser. No. 849,144

Int. Cl.[2] **C07D** *209/48, 217/24;* **A61K** *31/47, 31/40*

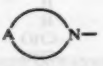
U.S. Cl. 424—267 **13 Claims**

1. An α-(cyclic tert.aminophenyl)aliphatic acid corresponding to the formula



in which R_1 is hydrogen or lower alkyl, R_2 is hydrogen, lower alkyl, lower alkenyl, cycloalkyl, cycloalkenyl, cycloalkyl-lower alkyl or cycloalkenyl-lower alkyl having 3 to 7 ring-members each, Ph is phenylene unsubstituted or substituted by one or two members selected from the group consisting of lower alkyl, hydroxy, mercapto, lowr alkoxy, lower alkylmercapto, halogeno, trifluoromethyl, nitro, amino, di-lower alkylamino, lower alkanoylamino, cyano, carbamoyl, di-lower alkyl-carbamoyl, carboxy, lower alkylsulfonyl, sulfo, sulfamoyl and di-lower alkyl-sulfamoyl, and

is 4,5,6,7-tetrahydrophthalimido or -homophthalimido, 4,7-dihydrophthalimido or -homophthalimido, phthalimido or homophthalimido unsubstituted or substituted in the aromatic portion by one or two members selected from the group consisting of lower alkyl, lower alkoxy, lower alkylmercapto, halogeno, trifluoromethyl, nitro, amino and di-lower alkylamino; or a lower alkyl ester, loweralkenyl ester, 3 or 7 ring-membered cycloalkyl ester, cycloalkenyl ester, cycloalkyl-lower alkyl ester cycloalkenyl-lower alkyl ester, **HPh-ester, HPh-lower alkyl ester, hydroxy-lower alkyl ester, lower alkoxy-lower alkyl ester, di-lower alkylamino-lower alkyl ester, lower alkyleneimino-lower alkyl ester or**



lower alkyl ester in which esters any hetero atom is separated from the carboxy-oxygen atom by at least 2 carbon atoms, the amide, a mono- or di-lower alkylamide, lower alkyleneamide, HPh-amide, HPh-lower alkylamide, or N-hydroxyamide, or a therapeutically acceptable salt thereof.

2. An anti-inflammatory pharma-ceutical composition comprising an anti-inflammatory effective amount of the compound as claimed in claim 1, together with a pharmaceutical excipient.

4,163,789
ANTI-PSYCHOTIC (CYCLOALKENYLALKYLPIPERIDINO) BENZAMIDES

Jacinto M. Mauri; Armando Vega-Noverola, and Robert G. W. Spickett, all of Barcelona, Spain, assignors to Anphar, S.A., Madrid, Spain

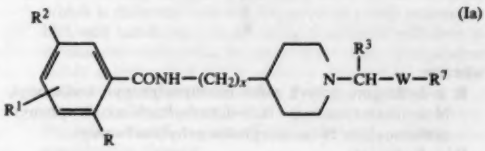
Filed Feb. 17, 1977, Ser. No. 769,529

Claims priority, application United Kingdom, Feb. 17, 1976, 6207/76; Jan. 24, 1977, 2728/77

Int. Cl.[2] **A61K** *31/445;* **C07D** *211/58, 211/26*

U.S. Cl. 424—267 **36 Claims**

1. A piperidine derivative of the general formula



(Ia)

wherein R represents a lower alkoxy or lower alkenyloxy group; R^1 and R^2, which may be the same or different, each represent a hydrogen or halogen atom, or a sulphonamido, amino, lower alkylamino, di(lower)alkylamino, lower alkylsulphonyl, or lower alkylsulphonamido group, or a lower acylamino group in which the acyl moiety is derived from a carboxylic acid, the halogen atom or group represented by the symbol R^1 being in the 3- or 4-position of the phenyl ring, with the proviso that R^1 and R^2 do not both represent hydrogen atoms; R^3 represents a hydrogen atom or a lower alkyl, lower alkenyl, or phenyl group, or a cycloalkyl or cycloalkenyl group having from 3 to 7 carbon atoms in the ring; R^7 represents a cycloalkenyl group having from 3 to 7 carbon atoms in the ring, unsubstituted or substituted by an alkyl group containing from 1 to 3 carbon atoms or a hydroxy(lower)alkyl or lower alkenyl group; x represents zero or 1, and W represents a single bond or a lower alkylene or lower alkenylene group, or a pharmaceutically acceptable acid addition salt or a quaternary ammonium derivative or an N-oxide thereof.

33. A method for treating psychoses and allied conditions in which neuroleptic therapy is beneficial, which comprises administering a compound of claim 1 to a mammalian host, said compound being administered in an amount effective to prevent or ameliorate psychotic states.

4,163,790
METHOD FOR INCREASING CORONARY BLOOD FLOW IN MAMMALS

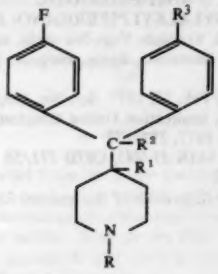
Bernard V. Franko, and Anthony G. Proakis, both of Richmond, Va., assignors to A. H. Robins Company, Inc., Richmond, Va.

Continuation-in-part of Ser. No. 795,846, May 11, 1977, abandoned. This application Mar. 14, 1978, Ser. No. 886,486

Int. Cl.[2] **A61K** *31/445, 31/535*

U.S. Cl. 424—267 **7 Claims**

1. The method for increasing coronary arterial blood flow in mammals which comprises administering to mammals in need of such treatment a coronary arterial blood flow increasing amount of a compound having the formula:



wherein:

R is hydrogen, acetyl, p-fluorobenzoylpropyl, carbamoyl, N-methylcarbamoyl, N,N-dimethylcarbamoyl, phenylcarbamoyl, or N-(ω-morpholinoethyl)carbamoyl;

R^1 is hydrogen;

R^2 is hydrogen or hydroxy, or

R^1 and R^2 taken together form a second bond between the carbon atoms bearing R^1 and R^2;

R^3 is hydrogen or fluorine, and

pharmaceutically acceptable acid addition salts thereof.

4,163,791

2-PHENYLIMINOTHIAZOLINE COMPOUNDS

Dieter Dürr, Bottomingen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

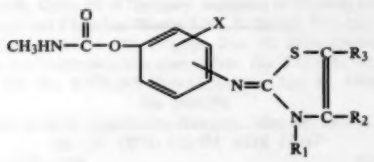
Filed Sep. 12, 1977, Ser. No. 832,753

Claims priority, application Switzerland, Sep. 17, 1976, 11815/76; Aug. 9, 1977, 9735/77

Int. Cl.² C07D *277/08*

U.S. Cl. 424—270 **12 Claims**

1. A thiazoline compound of the formula



wherein

x is hydrogen, halogen or C_1–C_4-alkyl,

R_1 is C_1–C_4-alkyl, and

R_2 and R_3 are each hydrogen or C_1–C_4 -alkyl, and salts thereof with inorganic acids selected from the group consisting of hydrochloric, sulfuric, hydrobromic and phosphoric acids, and with organic acids, selected from the group consisting of formic, acetic, oxalic, phthalic, succinic and citric acids.

11. An insecticidal and acaricidal composition comprising an insecticidally and acaricidally effective amount of a compound according to claim **1**, together with a suitable carrier therefor.

4,163,792

INSECTICIDAL OXADIAZOLE ESTERS

Willy Meyer, Riehen; Jozef Drabek, Oberwil; Laurenz Gsell, Füllinsdorf, and Friedrich Karrer, Zofingen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

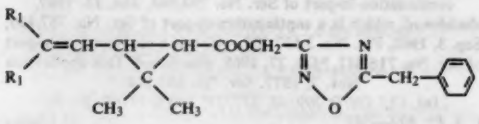
Continuation-in-part of Ser. No. 684,691, May 10, 1976, abandoned. This application Nov. 9, 1977, Ser. No. 849,744

Claims priority, application Switzerland, May 13, 1975, 6157/75; Apr. 6, 1976, 4300/76

Int. Cl.² A01N *9/22, 9/28;* C07D *271/06*

U.S. Cl. 424—272 **7 Claims**

1. A 2,2-dimethyl-3-vinyl-cyclopropanecarboxylic acid ester of the formula



wherein R_1 represents fluorine, chlorine or bromine.

6. A method of combatting insects of the family Muscidae at a locus, which method comprises applying to the locus an insecticidally effective amount of a compound as claimed in claim **1**.

4,163,793

USE OF CERTAIN THIOPHENECARBALDEHYDE PHENYLHYDRAZONES AS FUNGICIDES

Michael T. Clark, Sittingbourne, and Pieter Ten Haken, Herne Bay, both of England, assignors to Shell Oil Company, Houston, Tex.

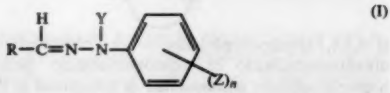
Continuation-in-part of Ser. No. 838,772, Oct. 3, 1977, abandoned. This application Jul. 3, 1978, Ser. No. 921,651

Claims priority, application United Kingdom, Oct. 5, 1976, 41300/76

Int. Cl.² A01N *9/12*

U.S. Cl. 424—275 **3 Claims**

1. A method for killing unwanted fungi which comprises subjecting such fungi to the effect of one of twenty hydrazones of the formula:



(I)

the twenty being the individual species wherein the substituent moieties are as follows, the numbers preceding the moieties, Z, indicating the position of each of such moieties on the phenyl ring:

R	Y	n	Z
2-thienyl	H	1	4-Cl
2-thienyl	H	1	4-Cl
2-thienyl	H	1	4-F
2-thienyl	H	0	—
2-thienyl	H	1	4-methyl
2-thienyl	—CHO	0	—
5-methyl-2-thienyl	—CHO	1	4-F
5-methyl-2-thienyl	—CHO	0	—
2-thienyl	H	1	2-Cl
5-bromo-2-thienyl	H	0	—
2-thienyl	H	1	4-Br
3-thienyl	—CHO	0	—
3-thienyl	—CHO	1	4-F
3-thienyl	—CHO	1	4-Cl
5-bromo-2-thienyl	—CHO	1	4-F
3-methyl-2-thienyl	—CHO	0	—
5-bromo-2-thienyl	—CHO	0	—
5-chloro-2-thienyl	H	1	4-F

-continued

R	Y	n	Z
5-chloro-2-thienyl	—CHO	1	4-F
5-chloro-2-thienyl	—CHO	1	4-Cl

4,163,794

2,3-DIHYDRO-6,7-DISUBSTITUTED-5-FUROYL BENZOFURAN-2-CARBOXYLIC ACIDS

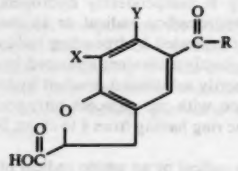
Edward J. Cragoe, Jr., Lansdale, and Otto W. Woltersdorf, Jr., Chalfont, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 678,529, Apr. 20, 1976, Pat. No. 4,087,542, which is a continuation-in-part of Ser. No. 594,839, Jul. 9, 1975, abandoned. This application Jan. 27, 1978, Ser. No. 873,023

Int. Cl.[2] A61K *31/34;* **C07D** *307/83*

U.S. Cl. 424—285 **6 Claims**

1. A compound of the formula



wherein

X is halo, methyl or hydrogen;

Y is halo or methyl;

X and Y can be combined to form a hydrocarbylene radical of from 3 to 4 carbon atoms;

R is selected from the group consisting of 2-furyl, 3-furyl or 5-methyl-2-furyl, and

the non-toxic pharmaceutically acceptable salt, ester and amide derivative thereof.

4,163,795

STABILIZED AQUEOUS AMIDE ANTIMICROBIAL COMPOSITION

George A. Burk, Bay City, Mich., assignor to The Dow Chemical Company, Midland, Mich.

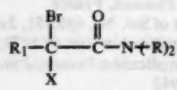
Filed Dec. 14, 1977, Ser. No. 860,540

Int. Cl.[2] A01N *9/20*

U.S. Cl. 424—304 **17 Claims**

1. An aqueous antimicrobial composition having a pH of from about 2 to about 5 and comprising:

(a) an alpha-halogenated amide antimicrobial compound of the formula:

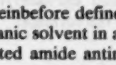


wherein:

X is hydrogen, halogen or a cyano radical;

each R group is independently hydrogen, a monovalent saturated hydrocarbon radical or an inertly substituted monovalent saturated hydrocarbon radical or the two R groups are jointly a divalent saturated hydrocarbon radical or an inertly substituted divalent saturated hydrocarbon radical which, taken with the adjacent nitrogen atom, forms a heterocyclic ring having from 4 to about 10 ring members; and

R_1 is a cyano radical or an amido radical of the formula:



wherein R is as hereinbefore defined;

(b) a water-miscible organic solvent in an amount sufficient to dissolve the halogenated amide antimicrobial, said solvent being a normally liquid polyalkylene glycol of the ethylene, trimethylene or tetramethylene series or a mono- or di-saturated hydrocarbyl ether thereof;

(c) water; and

(d) a stabilizing amount of an azine or a nitrile stabilizer which is different from the halogenated amide antimicrobial, said stabilizing amount being an amount sufficient to measurably reduce the decomposition of the halogenated amide antimicrobial in the aqueous composition and said azine or nitrile stabilizer being a saturated aliphatic or a saturated alicyclic compound containing a moiety of the formula >C=N—, a moiety of the formula —C≡N, or a combination thereof.

4,163,796

STABILIZED AQUEOUS AMIDE ANTIMICROBIAL COMPOSITION

George A. Burk, Bay City, Mich., assignor to The Dow Chemical Company, Midland, Mich.

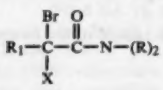
Filed Dec. 14, 1977, Ser. No. 860,543

Int. Cl.[2] A01N *9/20*

U.S. Cl. 424—304 **19 Claims**

1. An aqueous antimicrobial composition having a pH of from about 2 to about 5 and comprising:

(a) an alpha-halogenated amide antimicrobial of the formula:

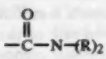


wherein:

X is hydrogen, halogen or a cyano radical;

each R group is independently hydrogen, a monovalent saturated hydrocarbon radical or an inertly substituted monovalent saturated hydrocarbon radical or the two R groups are jointly a divalent saturated hydrocarbon radical or an inertly substituted divalent saturated hydrocarbon radical which, taken with the adjacent nitrogen atom, forms a heteocyclic ring having from 4 to about 10 ring members; and

R_1 is a cyano radical or an amido radical of the formula:

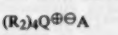


wherein R is as hereinbefore defined;

(b) a water-miscible organic solvent in an amount sufficient to dissolve the halogenated amide antimicrobial, said solvent being selected from the group consisting of normally liquid polyalkylene glycols of the ethylene, trimethylene, or tetramethylene series and the mono- and di-saturated hydrocarbyl ethers thereof;

(c) water; and

(d) a stabilizing amount of a quaternary ammonium or phosphonium stabilizer of the formula:



wherein:

$Q^{\oplus}$ is a quaternized atom of nitrogen or phosphorus;

each R_2 group is independently a monovalent saturated hydrocarbon radical; and $A^{\ominus}$ is a neutralizing anion,

said stabilizing amount being an amount of the stabilizer sufficient to measurably reduce the decomposition rate of the halogenated amide antimicrobial in the aqueous antimicrobial composition.

4,163,797

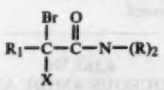
STABILIZED AQUEOUS AMIDE ANTIMICROBIAL COMPOSITION

George A. Burk, Bay City, and Charles E. Reineke, Midland, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 14, 1977, Ser. No. 860,541
Int. Cl.² A01N *9/20*
U.S. Cl. 424—304 **20 Claims**

1. An aqueous antimicrobial composition having a pH of from about 2 to about 5 and comprising:

(a) an alpha-halogenated amide antimicrobial compound of the formula:

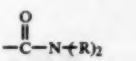


wherein:

X is hydrogen, halogen or a cyano radical;

each R group is independently hydrogen, a monovalent saturated hydrocarbon radical or an inertly substituted monovalent saturated hydrocarbon radical or the two R groups are jointly a divalent saturated hydrocarbon radical or an inertly substituted divalent saturated hydrocarbon radical which, taken with the adjacent nitrogen atom, forms a heterocyclic ring having from 4 to about 10 ring members; and

R_1 is a cyano radical or an amido radical of the formula:



wherein R is as hereinbefore defined;

(b) a water-miscible organic solvent in an amount sufficient to dissolve the halogenated amide antimicrobial, said solvent being a normally liquid straight chain polyalkylene glycol of the ethylene, trimethylene or tetramethylene series or a mono- or di-saturated hydrocarbyl ether thereof;

(c) water; and

(d) a stabilizing amount of a carbamoyl or sulfamoyl stabilizer wherein said stabilizing amount is an amount of the carbamoyl or sulfamoyl stabilizer which is sufficient to measurably reduce the decomposition rate of the halogenated amide in the aqueous antimicrobial composition and wherein said carbamoyl or sulfamoyl stabilizer corresponds to the formula:

in which:

Q is a carbonyl radical or a sulfonyl radical;

R_2 is a radical selected from the group consisting of: R_4, $-N(R_4)_2$, $-C(O)N(R_4)_2$, and $-NHC(O)N(R_4)_2$ wherein each R_4 independently is hydrogen or lower alkyl; and

each R_3 radical is independently selected from the group consisting of hydrogen and lower alkyl; or

one of the R_3 groups and the R_2 group, in combination, jointly form a divalent radical selected from the group consisting of $-CH_2-_3$, $-CH_2-_4$, $-CH_2-_5$, $-C(O)CH_2CH_2-$ and $-C(O)C(R_4)_2N(R_4)-$ wherein R_4 is as hereinbefore defined.

4,163,798

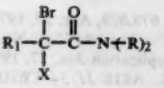
STABILIZED AQUEOUS AMIDE ANTIMICROBIAL COMPOSITION

George A. Burk, Bay City; Charles A. Wilson, and Charles E. Reineke, both of Midland, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 14, 1977, Ser. No. 860,642
Int. Cl.² A01N *9/20*
U.S. Cl. 424—304 **19 Claims**

1. An aqueous antimicrobial composition having a pH of from about 2 to about 5 and comprising:

(a) an alpha-halogenated amide antimicrobial compound of the formula:

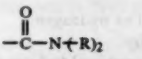


wherein:

X is hydrogen, halogen or a cyano radical;

each R group is independently hydrogen, a monovalent saturated hydrocarbon radical or an inertly substituted monovalent saturated hydrocarbon radical or the two R groups are jointly a divalent saturated hydrocarbon radical or an inertly substituted divalent hydrocarbon radical which, taken with the adjacent nitrogen atom, forms a heterocyclic ring having from 4 to about 10 ring members; and

R_1 is a cyano radical or an amido radical of the formula:



wherein R is as hereinbefore defined;

(b) a water-miscible organic solvent in an amount sufficient to dissolve the halogenated amide antimicrobial, said water-miscible organic solvent being selected from normally liquid, polyalkylene glycols of the ethylene, trimethylene or tetramethylene series and the mono- or di-saturated hydrocarbyl ethers thereof;

(c) water; and

(d) a stabilizing amount of an aldehyde stabilizer selected from the group consisting of saturated aliphatic aldehydes, saturated alicyclic aldehydes and carbocyclic aromatic aldehydes, said stabilizing amount being an amount of the stabilizer sufficient to measurably reduce the decomposition rate of the halogenated amide antimicrobial in the aqueous antimicrobial composition.

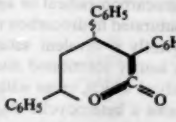
4,163,799

PSYCHOSTIMULANT COMPOUNDS

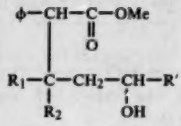
Pierre Simon, Sevres, France, assignor to Union Chimique Continentale U.C.C., Puteaux, France

Continuation-in-part of Ser. No. 695,751, Jun. 14, 1976, Pat. No. 4,113,742. This application Apr. 8, 1977, Ser. No. 786,485
Claims priority, application France, Jun. 13, 1975, 75 18491; Dec. 8, 1976, 76 36942
Int. Cl.² C07D *309/10*
U.S. Cl. 424—317 **7 Claims**

1. A tetrahydro-α-pyrone of the formula:



2. A compound of the formula



wherein R_1 is phenyl and R_2 is H; R' is alkyl of 1–4 carbon atoms, and Me is a pharmaceutically acceptable alkali metal.

4,163,800

TOPICAL COMPOSITION AND TREATMENT OF SKIN LESIONS THEREWITH

Richard R. Wickett, Hamilton, and William R. Kock, Cincinnati, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Aug. 17, 1977, Ser. No. 825,363
Int. Cl.[2] A61K *31/085, 31/155*
U.S. Cl. 424—326 **2 Claims**

1. A dermatological composition for treating skin lesions comprising a keratolytically effective amount of benzoyl peroxide and an amount for reducing the skin irritation thereof of a compound selected from the group consisting of guanidine hydrochloride, guanidine sulfate, guanidine carbonate, and guanidine phosphate.

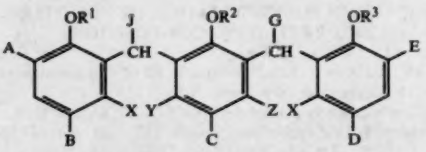
4,163,801

TREATMENT OF ANIMALS WITH 2,6-BIS(2-HYDROXYBENZYL)PHENOLS TO ERADICATE TREMATODES

Errol J. McGarry, Bundoora, and Bruce A. Forsyth, Croydon, both of Australia, assignors to ICI Australia Limited, Melbourne, Australia

Filed Jul. 5, 1977, Ser. No. 812,471
Claims priority, application Australia, Jul. 7, 1976, 6576/76
Int. Cl.[2] A61K *31/055, 31/05, 31/275*
U.S. Cl. 424—347 **19 Claims**

1. A method of treating warm blooded animals to eradicate trematodes which method comprises administering to the animal an effective amount of a composition comprising as active ingredient a compound of formula I:



wherein

R^1, R^2 and R^3 are independently chosen from the group consisting of hydrogen, C_1 to C_6 alkyl and C_2 to C_6 alkenyl;

B, C and D are independently chosen from the group consisting of halogen, C_1 to C_6 alkyl, C_2 to C_6 alkenyl, C_2 to C_6 alkoxy, hydroxy, cyano, nitro and the group COR^5 wherein R^5 is hydroxy or C_1 to C_6 alkoxy;

A, E, X, Y and Z are independently chosen from the group consisting of hydrogen, C_1 to C_6 alkyl, C_2 to C_6 alkenyl, C_2 to C_6 alkoxy, hydroxy, cyano, nitro and the group COR^5 wherein R^5 is hydroxy or C_1 to C_6 alkoxy;

J and G are independently chosen from the group consisting of hydrogen, C_1 to C_6 alkyl, trichloromethyl and, together with the geminal hydrogen, the group $=CCl_2$; or an optical isomer thereof; or a salt thereof.

4,163,802

PREPARATION OF YOGURT

Robert B. Redfern, and Samir F. Rizk, both of Raleigh, N.C., assignors to Pine State Creamery Company, Raleigh, N.C.

Filed Mar. 4, 1977, Ser. No. 774,415
Int. Cl.[2] A23C *9/12*
U.S. Cl. 426—43 **7 Claims**

2. The process of preparing a yogurt base and combining it with a sweetener base to form an improved yogurt food product comprising: blending approximately 4.9% by weight dried skim milk powder with approximately 41.3% by weight fresh skim milk; adding said blend to approximately 46% by weight whole milk; blending approximately 0.5% by weight stabilizer with approximately 7.3% by weight liquid cane sugar; combining said second mentioned blend with said mixture; pasteurizing and homogenizing said combined mixture; cooling the combined mixture to between 110° and 114° Fahrenheit; adding a yogurt culture at the rate of between 1.5% and 2.5%; allowing the combined mixture to stand between 2.5 and 4 hours until a pH of between 4.2 and 4.4 is obtained; cooling said combined mixture to between 40° and 45° Fahrenheit to provide said yogurt base; and adding to said yogurt base a sweetener base including in approximate proportions by weight, 21.4% whole milk containing approximately 3.3% butterfat, 3% cream, 6.7% skim milk powder, 3% dried whey, 55.8% liquid cane sugar having approximately 67.5% solids, 3.9% stabilizer, and 6.2% water whereby an improved yogurt is provided.

4,163,803

TURMERIC COLORING PROCESS AND COMPOSITION FOR FOODS AND BEVERAGES

Kenneth J. Goldscher, 600 Red Lion Rd., Apt. E12, Philadelphia, Pa. 19115

Filed Jul. 19, 1978, Ser. No. 926,226
Int. Cl.[2] A23L *1/22, 1/275*
U.S. Cl. 426—250 **16 Claims**

1. An edible composition for coloring or flavoring a food or beverage, said composition comprising

(a) turmeric or a derivative of turmeric containing curcumin, wherein said turmeric or turmeric derivative have a bitter taste; and

(b) a glycine in an amount sufficient to substantially reduce or eliminate said bitter taste.

4,163,804

THERMOPLASTIC COMPOSITION DERIVED FROM ANIMAL PARTS AND METHODS FOR PRODUCTION THEREOF

Robert H. Meyer; Charles I. Graham; John E. Rudolph, and Robert E. Haas, all of Lima, Ohio, assignors to Beatrice Foods Co., Chicago, Ill.

Filed Feb. 8, 1978, Ser. No. 876,124
Int. Cl.[2] A23L *1/31;* **A23J** *3/00*
U.S. Cl. 426—315 **25 Claims**

1. A method for producing a puffable, thermoplastic composition derived from animal parts comprising:

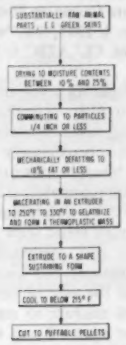
(1) drying substantially raw animal parts which contain no more than 25% hot oil rendered parts to moisture contents between 10% and 25%;

(2) comminuting the dried parts to particles having dimensions no greater than ¼ inch;

(3) mechanically defatting the comminuted particles at temperatures below 200° F. to an average fat content of less than 18% whereby protein contained in the particles is not substantially denatured and wherein mechanical means are used for said defatting;

(4) macerating the defated particles in an extruder barrel at temperatures between 250° F. and 330° F. and under sufficient pressure to cause mastication and gelatinization of the particles and to form a thermoplastic moldable mass;

(5) extruding the moldable mass into a shape sustaining extruded form;


SUBSTANTIALLY RAW ANIMAL PARTS, E.G. GREEN SKINS
DRYING TO MOISTURE CONTENTS BETWEEN 10% AND 25%
COMMINUTING TO PARTICLES 1/4 INCH OR LESS
MECHANICALLY DEFATTING TO 10% FAT OR LESS
MACERATING IN AN EXTRUDER TO 250°F TO 330°F TO GELATINIZE AND FORM A THERMOPLASTIC MASS
EXTRUDE TO A SHAPE SUSTAINING FORM
COOL TO BELOW 215° F
CUT TO PUFFABLE PELLETS

(6) cooling the extruded from to below 215° F.; and
(7) cutting the cooled form into puffable pellets.

4,163,805
RECONSTITUTED FOOD PRODUCT

Richard A. Mueller, Donnellson, Iowa, assignor to SCM Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 644,108, Dec. 24, 1975, abandoned. This application Dec. 23, 1976, Ser. No. 753,805
Int. Cl.[2] A23L *1/04*
U.S. Cl. 426—575 **9 Claims**

1. A process for making a reconstituted food product containing a semi-crisp natural food item which offers essentially the same semi-crisp texture and taste as said natural semi-crisp food item prepared by the steps of

(a) blending said food item in comminuted, unsalted form with a formulation containing water, water-soluble alginate binder and a carbohydrate comprising at least one sugar having a low sweetness level selected from the group consisting of monosaccharides and disaccharides; said formulation consisting essentially of on a weight basis;

(1) about 30% to about 75% of finely-divided, unsalted food product;

(2) an effective amount of said water-soluble alginate binder;

(3) said carbohydrate in the proportion of about 97.5–80 parts carbohydrate to about 2½–20 parts alginate, the alginate and carbohydrate together comprising about 6% to about 24% of the formulation; and

(4) water;

(b) subjecting said formulation to mixing;

(c) forming said formulation following mixing into a desired shape without substantial preliminary gelling;

(d) contacting said shape with a gelling solution containing calcium ion for a sufficient time period to harden the alginate and to produce said semi-crisp texture; and

(e) cutting said shape into pieces of predetermined size.

4,163,806
CHEESE CAKE

Dennis M. Callen, and Margo A. Callen, both of 4066 Montrose, Flint, Mich. 48504

Filed Apr. 21, 1977, Ser. No. 789,685
Int. Cl.[2] A23C *19/12*
U.S. Cl. 426—582 **7 Claims**

1. A process for preparing an unbaked cheese cake which comprises: (a) forming a mixture consisting essentially of cream cheese, non-dairy whipped topping and powdered sugar, the mixture containing from about ten to twenty-five weight percent of topping, from about fifteen to forty weight percent of sugar and the balance being cheese and (b) refrigerating said mixture for a period of time until firm to produce said cheese cake in final form without baking.

4,163,807
CITRUS FRUIT JUICE AND DRINK

Kristina R. Jackman, San Diego, Calif., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Mar. 15, 1978, Ser. No. 886,717
Int. Cl.[2] A23L *2/02*
U.S. Cl. 426—599 **6 Claims**

1. A citrus fruit product containing fruit pulp consisting of citrus fruit juice or fruit drink containing a citrus fruit juice having incorporated therein a combination of gums consisting essentially of from about 0.01 to about 0.1 weight % of xanthan gum, and from about 0.01 to about 0.14 weight % of sodium carboxymethyl cellulose having a degree of substitution of at least about 0.7 wherein the weight % is based on the total weight of the citrus fruit product whereby the citrus fruit product has enhanced stability and homogenity and the fruit pulp remains substantially suspended on standing.

4,163,808
PROCESS FOR PREPARING AN IMITATION MAYONNAISE AND SALAD DRESSING

Potito U. DePaolis, 131 Groverton Pl., Los Angeles, Calif. 90024

Filed Mar. 10, 1978, Ser. No. 885,309
Int. Cl.[2] A23L *1/24*
U.S. Cl. 426—613 **1 Claim**

1. A method of manufacture of an imitation dressing selected from the group consisting of an imitation mayonnaise and an imitation salad dressing, which comprises the steps of:

first admixing an amount of at least 3% but not in excess of 10% isolated soy protein by weight with 20% to 60% water by weight, spices and seasonings, and not more than about 10% of the total salad oil content in the finished dressing, by weight, for at least a five (5) minute period at ambient room temperature to produce a first admixture;

secondly blending, into said first admixture, from about 0.1% to 2.0%, by weight, vinegar; and

thereafter adding an additional amount of salad oil to bring the total salad oil content in the finished dressing to from 40% to 80% by weight, under high shearing action, to produce the final dressing.

4,163,809
RADIATION POLYMERIZATION OF POLYMERIC BINDER COATING COMPOSITIONS

Vincent D. McGinniss, Valley City; Vincent W. Ting, Brunswick, and Ann F. Kah, Macedonia, all of Ohio, assignors to SCM Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 619,747, Oct. 6, 1975, abandoned. This application Sep. 29, 1977, Ser. No. 837,855
Int. Cl.[2] B05D *3/06*; C08F *8/00*
U.S. Cl. 427—44 **3 Claims**

1. In a process for radiation curing a coating applied onto a metal substrate and subjected to a source of radiation wherein said coating composition comprises an ethylenically unsaturated polymerizable binder pigment, and 0 to 10% by weight of a photoinitiator, the improvement comprising:

incorporating in said coating composition a high T_g polymer additive having a glass transition temperature (T_g) greater than ambient curing temperature and added to the coating in the range of 10% to 40% by weight based on the weight of said coating, said high T_g polymer additive being substantially a linear polymer having a free end chain and pendant double bond and having a molecular weight of between about 1,000 and 50,000 whereby said high T_g polymer additive crosslinks with said binder upon exposure to said radiation and provides adhesion of said coating composition to the metal substrate.

4,163,810

ULTRAVIOLET CURABLE POWDER PAINTS

Vincent D. McGinniss, Valley City, Ohio, assignor to SCM Corporation, New York, N.Y.

Division of Ser. No. 739,526, Nov. 8, 1976, Pat. No. 4,129,488. This application Sep. 15, 1978, Ser. No. 942,762

Int. Cl.[2] C08G *18/00, 63/00*

U.S. Cl. 427—54 2 Claims

1. In a process for producing dry powder paint composition having an average particle size of less than about 325 mesh and a melting point of at least about 80° C., the powder paint composition containing a film-forming binder, the improvement comprising:

providing a spatial epoxy polyester polymer by co-reacting a preformed epoxy adduct having a molecular weight of at least about 100 and a preformed polyester adduct having a molecular weight of at least about 100 with an intervening linear polymer chain to produce a spatially arranged epoxy-polyester polymer having a molecular weight of between about 1,000 and 10,000, said epoxy polyester spatial polymer having an ultraviolet sensitizer connected to said polymer, and said polymer being an ethylenically unsaturated polymer and reactive to ultraviolet energy to cross-link the ethylenic unsaturation;

applying the powder paint composition to substrate;

heating to cause flow out of the powder paint onto the substrate to form a continuous film;

exposing the film to ultraviolet energy to cross-link and cure the film.

4,163,811

METHOD OF FABRICATING A FUEL CELL ELECTRODE

Gerda M. Kohlmayr, Glastonbury, and Paul Stonehart, Madison, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Continuation-in-part of Ser. No. 809,838, Jun. 24, 1977, abandoned, which is a continuation of Ser. No. 696,334, Jun. 15, 1976, abandoned. This application Apr. 10, 1978, Ser. No. 895,162

Int. Cl.[2] H01M *4/88, 4/92, 4/96;* B01J *23/40*

U.S. Cl. 427—115 15 Claims

1. The method of constructing a fuel cell electrode comprising the steps of:

forming an aqueous suspension of electrocatalyst particles;

adding a sol of a polyvalent metal oxide or solution of a salt of a polyvalent metal to said aqueous suspension, the valency of the metal of said sol or solution of said salt being 3 or greater, and the concentration of the metal oxide in the sol or the concentration of the metal cation in the salt solution is on the order of 10^{-2} to 10^{-7} M;

forming a separate aqueous suspension of colloidal hydrophobic polymer particles;

combining said aqueous suspensions forming a uniform aqueous suspension of electrocatalyst particles and hydrophobic polymer particles; and

fabricating said electrocatalyst particles and polymer particles into a fuel cell electrode.

4,163,812

CONTAINER COATING METHOD

Robert G. Coucher, Salt Lake City, Utah, assignor to W. R. Grace & Co., Cambridge, Mass.

Continuation of Ser. No. 502,811, Sep. 3, 1974, abandoned, which is a continuation-in-part of Ser. No. 140,838, May 6, 1971, abandoned, Ser. No. 223,969, Feb. 7, 1972, Pat. No. 3,987,937, and Ser. No. 337,005, Mar. 1, 1973, Pat. No. 3,851,140. This application Nov. 30, 1977, Ser. No. 855,960

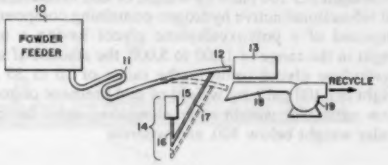
Int. Cl.[2] B05D *7/22*

U.S. Cl. 427—183 9 Claims

1. A process of coating the interior of a cylindrical two-piece tin can container having an open end and a closed end with an ultra-thin, continuous, pore-free comestible coating comprising:

(a) pneumatically conveying a finely divided thermosetting resinous powder from a powder feeding device to a spraying device at a substantially constant rate which deviates from the average less than about five percent by weight,

(b) heating said container to a temperature above the softening point of the resin, and then,



(c) pneumatically spraying into the interior of said container from a point external to said container a discrete quantum of said powder at a velocity of about 20 feet/min. to about 1600 ft./min.

(d) heating said coating to cause said resinous particles to form a continuous uniform film of resin on the interior of said container.

4,163,813

METHOD OF PREPARING AND APPLYING ARTISTIC DECORATIVE COMPOSITIONS

Nancy S. Sheets, and James R. Sheets, both of 268 Foster Knoll, Joppa, Md. 21085

Continuation-in-part of Ser. No. 679,927, Apr. 26, 1976, abandoned. This application Aug. 25, 1977, Ser. No. 827,728

Int. Cl.[2] B05D *5/00*

U.S. Cl. 427—198 7 Claims

1. In a process for the coating of a surface with a decorative coating which comprises the steps of mixing a farinaceous material with water in a ratio of one cup of water to one and one-half cups of farinaceous material to form an adhesive, said adhesive consisting essentially of farinaceous material and water, applying said adhesive to a backing material in irregular depth with suitable means; embedding inert material in a random pattern in the coating; the improvement of controlled drying at a temperature of 65 degrees F. for a period of 48 to 72 hours to produce a cracked surface, followed by the steps of coating the surface with a stain and a varnish.

4,163,814

METHOD OF COATING GLASS BOTTLE WITH AQUEOUS DISPERSED URETHANE COMPOSITION

Kiyotsugu Asai, Yokohama; Kazunori Takaguchi, Kawasaki; Toshihiko Kawabata, Fujisawa; Shigeru Yatsugi, Kawasaki, and Toshiyuki Ichikawa, Tokyo, all of Japan, assignors to Mitsui-Nisso Corporation, Tokyo, Japan

Division of Ser. No. 740,756, Nov. 10, 1976, abandoned. This application May 10, 1978, Ser. No. 904,419

Claims priority, application Japan, Nov. 13, 1975, 50-135645

Int. Cl.[2] B05D *3/02, 1/02*

U.S. Cl. 427—372 R 5 Claims

1. A method for coating a glass bottle with a single protective layer comprising applying an aqueous dispersed urethane composition on the outside surface of the glass bottle, said aqueous dispersed urethane composition comprising:

(a) a urethane oligomer obtained by interacting a mixture of two bifunctional active hydrogen-containing compounds and a monofunctional active hydrogen-containing isocyanate-blocking agent, and a diisocyanate under such conditions that an equivalent ratio of the active hydrogen contained in said mixture to the isocyanate group of said diisocyanate is about 1.0,

(b) a hardener mixed with said urethane oligomer in an

equivalent ratio of the blocked isocyanate of said urethane oligomer to the active hydrogen of said hardener in the range of 1:0.8 to 1.2 whereby a thermosetting urethane composition is obtained,

(c) water in an amount of 100 to 250 parts by weight per 100 parts by weight of said urethane oligomer, and

(d) a surface active agent for dispersing said thermosetting urethane composition in said water, the amount of said surface active agent being in the range of 4 to 25 parts by weight per 100 parts by weight of said urethane oligomer,

said bifunctional active hydrogen-containing compounds being composed of a polyoxyalkylene glycol having a molecular weight in the range of 1,200 to 5,000, the amount of said polyoxyalkylene glycol being in the range of 10 to 35 parts by weight per 100 parts by weight of said urethane oligomer, and a low molecular weight chain-elongating agent having a molecular weight below 500, and wherein

$$\frac{A+G}{E+F+G} \times 100 = 15 - 35\%$$

where

A is the weight of said polyoxyalkylene glycol in the aqueous dispersed urethane composition,

G is the weight of said surface active agent in the aqueous dispersed urethane composition,

E is the weight of said urethane oligomer in the aqueous dispersed urethane composition, and

F is the weight of said hardener in the aqueous dispersed urethane composition,

and then drying and curing the composition under temperature and time conditions to form a film on said bottle.

4,163,815

CATALYZED POLYISOCYANATE COATING COMPOSITIONS

Mo-fung Cheung, Warren, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Sep. 19, 1977, Ser. No. 834,859
Int. Cl.[2] B05D *3/02*
U.S. Cl. 427—385 R **9 Claims**

1. A method for making high solid isocyanate coating compositions and curing them into continuous polymeric coatings, which comprises:

(I) admixing in film forming amount in the coating composition: (A) a major amount by weight organic polyisocyanate and (B) a minor amount by weight of reaction product made by reacting (1) organic secondary amine comprising monoamine and (2) epoxy terminated compound wherein the equivalent ratio of (1) to (2) is about 1:1 and the reaction product adduct has:

(i) hydroxy functionality;

(ii) tertiary amino functionality; and

(iii) a number average molecular weight in excess of about 150, wherein (B) is at least about 2.5% by weight of (A);

(II) applying the coating composition of (I) that comprises (A) and (B) to a substrate; and

(III) exposing the coating composition that is applied to the substrate to elevated temperature to yield the continuous polymer coating.

4,163,816

NOVEL METHOD FOR FORMING SILVER DIFFUSION TRANSFER IMAGE RECEIVING LAYERS

Robert D. Eckert, Lexington; Boris Levy, Wayland, and John B. Mahoney, Tewksbury, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Oct. 27, 1977, Ser. No. 846,157
Int. Cl.[2] B05D *1/34, 1/36, 3/10*
U.S. Cl. 427—401 **12 Claims**

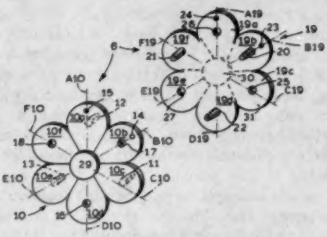
1. A method for forming an image-receiving element for use in a silver diffusion transfer process which comprises the steps of acid hydrolyzing a solution of cellulose ester, coating a support with said hydrolyzed cellulose ester and disposing silver precipitating nuclei in said hydrolyzed cellulose ester.

4,163,817

DECORATIVE PATCH

Norman L. DiCarlantonio, 8224 Raymond La., Potomac, Md. 20854, and Jerome F. Thiel, 2412 Nottingham Dr., Falls Church, Va. 22043

Filed Dec. 9, 1977, Ser. No. 859,197
Int. Cl.[2] F16B *5/07, 2/06;* B32B *3/10;* F16B *17/00*
U.S. Cl. 428—33 **6 Claims**



1. A patch for attachment to a thin material for repairing and decorating thin materials comprising a first ornamental or decorative member and a second ornamental or decorative member; said first ornamental or decorative member having a substantially flat surface adapted to contact one side of said thin material, said second ornamental or decorative member having a substantially flat surface adapted to contact the opposite side of said thin material, said first and said second ornamental or decorative members each having a plurality of spaced projections projecting from the substantially flat surface of said ornamental or decorative member, said plurality of spaced projections being adapted to pierce said thin material, said first and said second ornamental or decorative members each having a plurality of spaced apertures spaced to receive the plurality of spaced projections of the other ornamental or decorative member, each of said apertures extending completely through said ornamental or decorative members and being tapered with the larger opening thereof being located near the point of entry for the corresponding projection of the other ornamental or decorative member and the smaller opening thereof being located near the point of exit for said projection, the spaced apertures and spaced projections of each of said first and second ornamental or decorative members being located to permit said first and said second ornamental or decorative members to be oriented with respect to each other in order that the projections fit into different apertures, each of said projections having a plurality of substantially equally spaced raised portions extending from the outer surface thereof, said raised portions being compressible as said projections are forced into said apertures and being sufficiently oversized with respect to said apertures to achieve an interference fit.

4,163,818

ANTI-SLIP SERVING TRAY AND THE METHOD OF MANUFACTURING THEREOF

Pierre Wernli, Turmweg 3, 2560 Nidau, Switzerland

Filed Feb. 15, 1978, Ser. No. 877,966
Int. Cl.[2] B29D *9/00;* B29C *27/14*
U.S. Cl. 428—138 **3 Claims**

1. A method of manufacturing an anti-slip laminate suitable for making a tray, comprising:

stacking sheets of paper impregnated with melamine sheets alternately with sheets of paper impregnated with phenolic resins, the last mentioned sheets having a greater density of impregnated resins than the first-mentioned sheets,

placing on the stack a loosely woven cloth covered on its upper face with a layer of porous PVC, said cloth having from eight to ten perforations per square centimeter, the perforations having a diameter of 0.1 to 0.2 mm. pressing the stack in a tray mold with said cloth thereon under a temperature of about 140° C. and at a pressure of about 60 kg./cm.^{2} for about ten minutes, and removing a molded laminate from said mold.

4,163,819

DRAPEABLE NONWOVEN FABRICS

Kai-Lim W. Yung, and Bernard Silverman, both of Raleigh, N.C., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 27, 1977, Ser. No. 864,883
Int. Cl.^{2} B05D *1/14;* B32B *7/14*
U.S. Cl. 428—198 **20 Claims**

1. A process for bonding fibers to produce nonwoven fabrics comprising forming fibers from a melt blend comprising a polyamide and a lactam-polyol-polyacyl lactam or acyl polylactam terpolymer wherein the melt blend has at least about 0.1 weight % polyol based on the weight of the melt blend and contacting the said fibers at a temperature of from 20° C. to 250° C.

4,163,820

FLAME-RETARDANT PARTICLEBOARD

Hans A. Corver, and Allan J. Robertson, both of St. Catharines, Canada, assignors to American Cyanamid Company, Stamford, Conn.

Filed Nov. 18, 1974, Ser. No. 524,697
Claims priority, application Canada, Jul. 29, 1974, 205863
Int. Cl.^{2} B32B *7/02, 21/08*
U.S. Cl. 428—212 **5 Claims**

1. A flame-retardant particleboard comprising (1) a core of wood particles having a size of from about 8 Tyler mesh to about 14 Tyler mesh, (2) at least one outer layer on said core of wood particles having a size of from about 15 Tyler mesh to about 150 Tyler mesh, only said outer layer wood particles having (3) water-insoluble ammonium polyphosphate of from about 25–175 Tyler mesh added thereto, all of said wood particles having been glued with resin and pressure consolidated into said particleboard, wherein the pH of said ammonium polyphosphate at 5% aqueous slurry ranges from about 4.5 to about 6.5 and the pH values of said resin, said wood particles and said ammonium polyphosphate match to within about 0.5 unit.

4,163,821

ADHESIVE BONDING OF METALLIC GLASS FABRIC

Louis F. Nienart, Bloomsbury; Gregory J. Sellers, Morristown; Gerald R. Bretts, Livingston, and Dirk A. Timan, Morristown, all of N.J., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Dec. 29, 1977, Ser. No. 865,453
Int. Cl.^{2} B32B *7/00*
U.S. Cl. 428—245 **22 Claims**

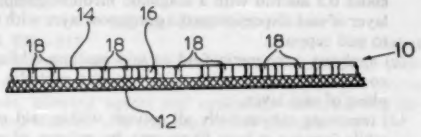
1. A method for adhesively bonding together the stands of a fabric composed of a glassy metal alloy which comprises applying a liquid polymeric adhesive curable to the solid state to the fabric, followed by curing the liquid adhesive to form a polymeric coating on the fabric.

4,163,822

PRESSURE SENSITIVE ADHESIVE MATERIAL AND METHOD OF PREPARATION

Brian W. Walter, Bishop's Stortford, England, assignor to Smith & Nephew Research Limited, Harlow, England

Filed Jul. 26, 1976, Ser. No. 708,775
Claims priority, application United Kingdom, Jul. 29, 1975, 31616/75
Int. Cl.^{2} B32B *3/26, 5/18*
U.S. Cl. 428—304 **14 Claims**



1. A process for making a water vapor permeable pressure sensitive adhesive material, which comprises

(A) forming on a surface, which is poorly wettable (or non-wettable) by water, a continuous coating of an aqueous emulsion based pressure sensitive adhesive having dispersed therein a water immiscible organic liquid, which is more volatile than water and which does not break the emulsion;

(B) leaving the coating at room temperature until pores develop and reach an average diameter of at least 100 microns;

(C) drying the coating at a higher temperature of at least 60° C.; and

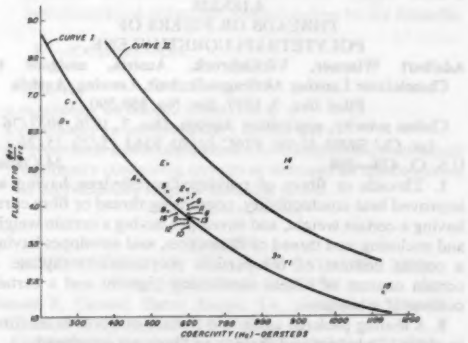
(D) transferring the adhesive mass to a water vapor permeable backing material; wherein said water immiscible organic liquid is a petroleum ether mixture.

4,163,823

MAGNETIC RECORDING ELEMENTS AND PROCESS OF PREPARATION

Jean-Pierre Legras, Clichy-sous-Bois, and Claude M. Maréchal, Paris, both of France, assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 7, 1977, Ser. No. 775,118
Claims priority, application France, Mar. 12, 1976, 76 07073
Int. Cl.^{2} H01F *10/02*
U.S. Cl. 428—304 **23 Claims**



1. A magnetic recording element comprising a support having a surface with a peak-to-peak roughness up to about 0.5 micron which surface is coated with a magnetic recording medium having a thickness in the range of 4 to about 20 microns; said medium comprising (1) about 8 to 30 percent, by volume, of discrete, non-solid, nonmagnetizable voids substantially homogeneously dispersed therein and (2) aligned and oriented acicular magnetizable particles dispersed in a mag-

netic recording layer which layer forms a surface of said element and has a surface smoothness, determined as percent contact area, of at least 86 percent, the ratio of said thickness to said peak-to-peak roughness (t/r) being at least about 10.

14. A process for the manufacture of a magnetic recording element having both low modulation noise and high magnetic particle alignment and orientation which process comprises the steps of:

(a) forming a dispersion of acicular magnetizable particles in a solution of binder in solvent,

(b) coating a support having a peak-to-peak roughness up to about 0.5 micron with a magnetic medium comprising a layer of said dispersion as the outermost layer with respect to said support,

(c) applying a magnetic field to said medium while it still contains solvent to align said magnetic particles, in the plane of said layer,

(d) removing substantially all solvent within said medium while forming at least 10 percent, by volume, of substantially homogeneously dispersed, discrete, gaseous nonmagnetizable voids, and

(e) compacting said medium to reduce the volume of said voids by at least 15 percent to a final volume of about 8 to 30 percent and to obtain a ratio of said thickness to said peak-to-peak roughness of at least about 10 while imparting a surface smoothness, determined as percent contact area, of at least 86 percent to said layer.

4,163,824

FIBER FOAM AND PROCESS

Glen E. W. Saidla, Hampton Falls, N.H., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Division of Ser. No. 565,949, Apr. 7, 1975, Pat. No. 4,073,840, which is a continuation-in-part of Ser. No. 407,829, Oct. 19, 1973, abandoned. This application Sep. 23, 1977, Ser. No. 836,042

Int. Cl.[2] **B32B** *5/18, 5/26*

U.S. Cl. 428—313 **3 Claims**

1. A fiber-reinforced structural foamed article comprising: a foamed resin and from about 1 wt. % to about 50 wt. % of discrete glass fiber filaments of staple length, said article having a low density core and a high density integral skin and said fiber filaments being randomly oriented and distributed throughout the foamed article, the weight ratio of fiber to foamed resin and integral skin being substantially uniform throughout.

4,163,825

THREADS OR FIBERS OF POLYTETRAFLUORETHYLENE

Adalbert Wimmer, Vöcklabruck, Austria, assignor to Chemiefaser Lenzing Aktiengesellschaft, Lenzing, Austria

Filed Dec. 7, 1977, Ser. No. 858,390

Claims priority, application Austria, Dec. 7, 1976, 9037/76

Int. Cl.[2] **B65D** *53/06;* **F16C** *33/20;* **F16J** *15/20, 15/22*

U.S. Cl. 428—368 **34 Claims**

1. Threads or fibres of polytetrafluorethylene having an improved heat conductibility, comprising thread or fibre cores having a certain weight, and envelopes having a certain weight and enclosing said thread or fibre cores, said envelopes having a certain content of fine-particle polytetrafluorethylene, a certain content of a heat conducting pigment and a certain content of a binder.

9. A sealing package using said threads or fibres as set forth in claim **1**, wherein said threads or fibres are interlaced.

10. A method of producing threads or fibres of polytetrafluorethylene having an improved heat conductibility, comprising

providing a filament or yarn core of polytetrafluorethylene and having a certain weight,

providing an aqueous dispersion containing between 30 and 70% by weight of solids, said solids including between 30 and 90% by weight of conducting pigment, between 10 and 70% by weight of fine-particle polytetrafluorethylene, and maximally 5% by weight of emulsifying agent, said 5% by weight of the emulsifying agent being based on the amount of solids,

immersing said filament or yarn core into said aqueous dispersion so as to avive said filament or yarn core with an envelope of said aqueous dispersion,

squeezing off excessive aqueous dispersion from said avived filament or yarn core,

drying said avived filament or yarn core,

treating said avived filament or yarn core with an antifriction agent, and

quilling said avived filament or yarn core.

4,163,826

SELF-BONDING MAGNET WIRES AND COILS MADE THEREFROM

Munetaka Kawaguchi, and Masayoshi Miyake, both of Nagoya, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Feb. 28, 1978, Ser. No. 881,940

Claims priority, application Japan, Feb. 28, 1977, 52/21844

Int. Cl.[2] **H01B** *3/30;* **H01F** *5/06*

U.S. Cl. 428—371 **16 Claims**

1. A self-bonding magnet wire comprising an electrical conductor having directly thereon or on an electrical insulation layer thereon a coated and baked layer of an enamel comprising a polymer solution containing the reaction product obtained on heating to at least 120° C. two or more copolyamides, at least one of which is a copolyamide having a nylon-12 unit in the molecule thereof, in a solvent containing at least one compound with a phenolic hydroxyl group in the molecule thereof.

4,163,827

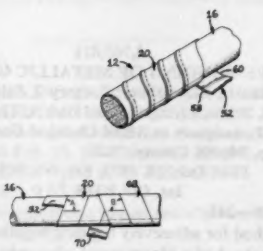
METHOD OF MAKING A WRAPPED INNOCULATION ROD SUITABLE FOR MODIFYING THE COMPOSITION OF MOLTEN METALS

John R. Nieman, and S. David Sanders, both of Pekin, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Jan. 23, 1978, Ser. No. 871,722

Int. Cl.[2] **B31C** *13/00;* **B65H** *81/06, 81/08;* **C22C** *33/00*

U.S. Cl. 428—377 **9 Claims**



1. A filled tubular inoculation rod (**12**) for controlled insertion into a molten metal for altering same, comprising:

an extruded elongated core element means (**16**) for treating

the molten metal, said core element means (16) including a particulate mixture of a treating agent (28) and a binding agent (30) consolidated in a preselected range of about 85% to 95% theoretical density, said treating agent (28) comprising about 90% or more of the total weight of said core element means (16) and said binding agent (30) comprising about 1% to not more than 10% of the total weight of said core element means (16); and

casing means (20) for substantially covering the entire exterior surface of said core element means (16) and containing said core element means (16), said casing means (20) being intimately and helically wrapped about said core element means (16).

6. A method of making a filled tubular inoculation rod (12) for controlled insertion into a molten metal for altering same, comprising:

Step (a) mixing a particulate treating agent (28) and a binding agent (30) and forming a treating material (24);

Step (b) extruding the treating material (24) from an extruding apparatus (14) and forming a continuously elongating core element (16); and

Step (c) helically wrapping said elongating core element (16) in a protective casing as the core element (16) extends from the extruding apparatus (14).

4,163,828
PARYLENE STABILIZATION

Dennis M. Mahoney, Long Valley, N.J., assignor to Union Carbide Corporation, New York, N.Y.

Filed Jan. 20, 1978, Ser. No. 871,145
Int. Cl.[2] B32B 9/04
U.S. Cl. 428—411 **5 Claims**

1. An article comprising:

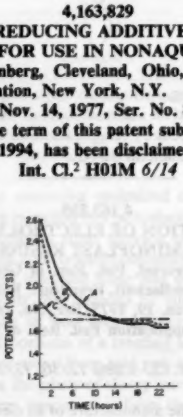
(a) a solid substrate; and

(b) a coating on said substrate, said coating comprising parylene admixed with (i) a sterically hindered phenol vaporizable at a temperature in the range of about 20° C. to about 150° C. (ii) pyrogallol wherein the amount of phenol or pyrogallol admixed with the parylene is about 0.1 to about 15 percent by weight based on the weight of the parylene.

4,163,829
METALLIC REDUCING ADDITIVES FOR SOLID CATHODES FOR USE IN NONAQUEOUS CELLS

Marvin L. Kronenberg, Cleveland, Ohio, assignor to Union Carbide Corporation, New York, N.Y.

Filed Nov. 14, 1977, Ser. No. 851,192
The portion of the term of this patent subsequent to Sep. 13, 1994, has been disclaimed.
Int. Cl.[2] H01M 6/14
U.S. Cl. 429—194 **15 Claims**



1. A nonaqueous cell having an anode, an electrolyte comprising an organic solvent and a solute, and a solid cathode, said solid cathode comprising a major amount of solid active material, a minor amount of graphite and/or carbon, and a minor amount of a metallic reducing agent, said metallic reducing agent being sufficient to reduce any materials in the cell which are more cathodic than the active cathode material with respect to the anode.

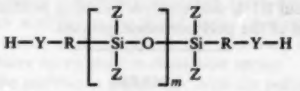
4,163,830
PROCESS FOR THE PRODUCTION OF NEW POLYSILOXANE-POLYOXYALKYLENE COPOLYMERS WITH REDUCED BURNING PROPERTIES

Erwin Windemuth, Bad Sooden-Allendorf; Manfred Dahm, Leverkusen; Manfred Dietrich, Leverkusen, and Peter Müller, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 748,029, Dec. 6, 1976, Pat. No. 4,096,162. This application Mar. 13, 1978, Ser. No. 885,424
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1975, 2558523
Int. Cl.[2] C08J 9/00
U.S. Cl. 521—111 **3 Claims**

1. In a polyurethane foam made from isocyanates, compounds with two or more isocyanate reactive hydrogen atoms, stabilizers, blowing agents and optionally catalysts, the improvement wherein said stabilizer is one produced by

(a) reacting organopolysiloxanes corresponding to the general formula:



wherein

m represents an integer from 1 to 100,

Z, which may be the same or different, represents a C_1–C_5 alkyl radical, a C_6–C_{15} aryl radical, a siloxyl or a siloxanyl radical or the group —R—Y—H,

R represents a C_1–C_6 alkylene radical which may contain one or more hetero atoms,

Y represents —NR′—, —O—,

or —S— and

R′ represents a hydrogen atom or C_1–C_6 alkyl or C_5–C_9 cycloalkyl radical, with polyisocyanates in an NCO:YH equivalent radio of at least 2,

(b) heating the NCO-containing addition products thus obtained at from 110° to 160° C. to cause branching and,

(c) reacting the resulting branched NCO-containing addition products of relatively high molecular weight with a monofunctional polyether corresponding to the formula:

$$R''—(OC_nH_{2n})_x—OH$$

wherein

n represents an integer from 2 to 4,

x represents an integer from 1 to 100 and

R″ represents a monofunctional C_1–C_{20} hydrocarbon radical optionally containing oxygen or nitrogen as hetero atoms, in an NCO:OH ratio of from 0.8 to 1.2.

4,163,831
HIGH EFFICIENCY TITANATE CATALYST FOR POLYMERIZING OLEFINS

Donald E. Gessell, Baton Rouge, La., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 581,293, May 27, 1975, abandoned, which is a continuation-in-part of Ser. No. 463,213, Apr. 22, 1974, abandoned. This application Oct. 26, 1976, Ser. No. 735,481
Int. Cl.[2] C08F 4/66, 10/02
U.S. Cl. 526—153 **9 Claims**

1. A process for polymerization of an α-olefin under conditions characteristic of Ziegler polymerization at a temperature in the range from about 0° to about 95° C. and in the presence

of a catalyst consisting essentialy of (I) catalytic reaction product of (A) an ester of tetravalent or trivalent titanium with (B) an intermediate reaction product of (a) an organomagnesium component selected from an organomagnesium compound or a hydrocarbon soluble complex of the organomagnesium compound and an organometallic compound which solubilizes the organomagnesium compound in hydrocarbon and (b) a metallic halide provided that during the formation of the intermediate product the concentration of the organomagnesium component is at least 0.1 molar with respect to the magnesium up to the maximum concentrations at which the intermediate reaction product in slurry form is still stirrable, said metallic halide corresponding to the empirical formula $MR_{3-a}X_a$ wherein N is a metal of Group 3a, R is alkyl, alkoxy, aryl or aryloxy; X is halogen; and a is in the range from 1 to 3 provided that wherein the organomagnesium component is an organomagnesium compound, a is in the range from 1 to 2.1, the proportions of the foregoing components of said catalytic reaction product being such that the atomic ratio of Mg:Ti is within the range from about 20:1 up to about 200:1, the atomic ratio of M:Ti is within the range from about 60:1 to about 150:1, the atomic ratio of Mg:X is within the range from about 0.1:1 to about 0.1:1, said catalytic reaction product being the sole catalyst of the polymerization process.

4,163,832
POLYTHIOETHERS FORMED BY ANIONIC RING OPENING OF EPISULFIDES

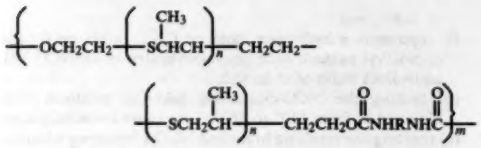
Alexis A. Oswald, Mountainside, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 618,777, Oct. 2, 1975, which is a continuation of Ser. No. 397,944, Sep. 17, 1973, abandoned, which is a continuation of Ser. No. 23,001, Mar. 26, 1970, abandoned. This application Nov. 21, 1977, Ser. No. 853,523

Int. Cl.[2] C08G *18/00*

U.S. Cl. 528—76 **56 Claims**

55. A polythioether dithiol hydrocarbyl diisocyanate polyadduct compound of the general formula:



wherein n is an integer of 3 to 1000 and m is an integer of 1 to about 10, R is a C_1 to $C_{200,000}$ divalent hydrocarbon radical.

4,163,833
METHOD FOR MAKING AROMATIC CYCLIC POLYFORMAL

Donald S. Johnson, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed May 15, 1978, Ser. No. 905,635

Int. Cl.[2] C08G *65/40*

U.S. Cl. 528—205 **5 Claims**

1. A method for making aromatic cyclic polyformal which comprises

(A) refluxing a plural phase mixture comprising

(a) a bisphenol of the formula,

HO—R—OH,

(b) alkali metal hydroxide,

(c) water,

(d) methylene halide and

(e) a phase transfer catalyst,

where in the plural phase mixture, the concentration of bisphenol does not exceed 3% by weight of the aqueous phase, there is utilized per mole of the bisphenol, more than 2 moles of alkali metal hydroxide and more than 1 mole of methylene halide, and there is present by volume at least 0.5 part of organic phase, per part of aqueous phase,

(B) recovering aromatic cyclic polyformal from the mixture of (A), by effecting the separation of the aromatic cyclic polyformal by the use of methanol or by effecting the evaporation of organic solvent therefrom,

where R is selected from $C_{(6-25)}$ divalent aromatic radicals.

4,163,834
POLYETHERS OF TETRAHALOBISPHENOL A

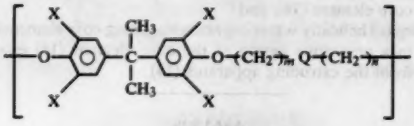
Robert L. Wear, West St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jan. 2, 1976, Ser. No. 645,957

Int. Cl.[2] C08G *65/40*

U.S. Cl. 525—534 **14 Claims**

1. A linear, polyether containing recurring units of the formula



wherein X is a halogen selected from Br and Cl, m and n are each integers of 1 to 4 and each Q is selected from —CH_2—, and

wherein not more than 75 mole percent of the Q groups are

said polyether having a weight average degree of polymerization of at least 50 and an inherent viscosity of at least 0.2 when measured in a ¼ percent by weight solution of said polyether in 1,1,2,2-tetrachloroethane at 30° C.

4,163,835
PREPARATION OF ELECTROLYTE-FREE AMINOPLAST RESINS

Steffen Piesch, Oberursel, Fed. Rep. of Germany, assignor to Cassella Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Jan. 19, 1977, Ser. No. 760,651

Claims priority, application Fed. Rep. of Germany, Jan. 31, 1976, 2603768

Int. Cl.[2] C08G *12/30, 12/32*

U.S. Cl. 528—254 **12 Claims**

1. A process for the manufacture of an electrolyte-free etherified methylolaminotriazine, wherein in the absence of electrolyte the aminotriazine is condensed with from about 1.3 mols to 2 n mols of formaldehyde per mol of aminotriazine where n is the number of amino groups in the aminotriazine, in an excess of etherifiying alcohol having the formula

$$R—(OCH_2CH_2)_mOH$$

R denoting an alkyl group with 1 to 4 C atoms and m repre-

senting an integer from 1 to 4, by heating such a condensation mixture having a water content of not over about 10% by weight to from about 50° to about 180° C. until the condensation has taken place and the degree of etherification is at least about 33%.

4,163,836

PROCESS FOR THE MANUFACTURE OF SOLUBLE COPOLYMERS WHICH CONTAIN HYDROXYL GROUPS AND CAN BE CROSSLINKED WITH ORGANIC POLYISOCYANATES

Horst Dalibor, Norderstedt, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Jan. 19, 1977, Ser. No. 760,360

Claims priority, application Fed. Rep. of Germany, Jan. 29, 1976, 2603259

Int. Cl.² C08F *212/08*

U.S. Cl. 528—366 4 Claims

1. Process for the manufacture of a soluble copolymer, which contains hydroxyl groups, and which copolymer can be crosslinked with organic polyisocyanates which comprises heating in an inert organic solvent in the presence of a polymerization initiator and optional chain stoppers, simultaneous esterification and polymerization taking place, a mixture which consists of

(a) 26–28% by weight of styrene,

(b) 20–22% by weight of methyl methacrylate,

(c) 18–20% by weight of hydroxyethyl methacrylate,

(d) 7.5–8.5% by weight of acrylic acid, and

(e) 25.0–27.0% by weight of glycidyl esters, of α-alkylalkanemonocarboxylic acids and/or α,α-dialkylalkanemonocarboxylic acids, having the empirical formula $C_{13}H_{24}O_3$ and in which the amounts of the compounds (a) to (e) must add up to 100% by weight, said components (c), (d), and (e) being employed in amounts such that the reaction product has a content of hydroxyl groups of 4.0 to 5.0% by weight, based on the weight of the starting monomers, and the components (d) and (e) are employed in a molar ratio of (d):(e) of 1.01 up to 1.1 to 1.0, until the reaction mixture has acid numbers of between 6 and 12.

4,163,837

MULTIPLE LOCI COUNTER-CURRENT WASHING

Elton E. Rush, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 16, 1977, Ser. No. 852,140

Int. Cl.² C08F *6/00*

U.S. Cl. 528—498 8 Claims

1. A method for removing undesired components from a solid which consists essentially of introducing a slurry of solids into one end of a treating zone, moving said solid as a slurry through said treating zone countercurrently to a flowing treating agent introduced into said zone and moved through said zone characterized in that regions of turbulent mixing are formed separated by at least two temperature interfaces by introducing several portions of a treating agent to loci spaced at different distances away from said one end, a portion introduced farthest from the place of slurry introduction being at a substantially different temperature from that of the slurry and a portion of treating agent introduced intermediate the introduction of the slurry and the first introduced agent being at a temperature intermediate the temperature of the slurry and said first portion of introduced agent, the densities and temperatures of the solids and the treating agent being different and differing to an extent, rendering possible the countercurrent flow of the solids and the treating agent and the formation of regions of turbulent mixing separated by at least two temperatures interfaces.

4,163,838

PROCESS FOR THE PRODUCTION OF POLYVINYL CHLORIDE BASED POWDERS SUITABLE FOR PLASTISOL PREPARATION

Josef Kalka, Herten, Fed. Rep. of Germany, assignor to Chemische Werke Hüls Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Nov. 3, 1977, Ser. No. 848,259

Claims priority, application Fed. Rep. of Germany, Nov. 3, 1976, 2650331

Int. Cl.² C08J *3/12*

U.S. Cl. 528—501 6 Claims

1. In a process for the production of polyvinyl chloride based powders suitable for plastisol preparation, wherein such powders are obtained by:

polymerization of vinyl chloride in (a) a dispersion comprising an aqueous emulsion in the presence of water-soluble catalysts or (b) a microsuspension in the presence of oil-soluble catalysts;

addition of at least one additive material; and

spray-drying the dispersion;

an improvement comprising separately spray-drying at least one such additive in the liquid phase concurrently with the dispersion while simultaneously intimately intermixing the additive spray and the dispersion spray;

wherein the additive is immiscible with the polyvinyl chloride dispersion and is a material which improves at least one of the thermostability of the powder, the rheological properties of the plastisol to be prepared from the powder or the foam characteristics of the foam to be produced from the plastisol.

4,163,839

ISOCOFORMYCIN AND A PROCESS FOR THE PRODUCTION THEREOF

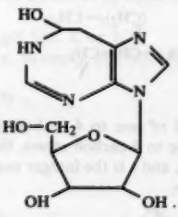
Hamao Umezawa; Tomio Takeuchi, both of Tokyo; Shinichi Kondo, Yokohama, and Masami Shimazaki, Kokunbunji, all of Japan, assignors to Zaidan Hojin Biselbutsu Kagaku Kenkyu Kai, Tokyo, Japan

Filed Dec. 9, 1977, Ser. No. 858,928

Int. Cl.² C07H *19/04;* A61K *31/70*

U.S. Cl. 536—24 1 Claim

1. The compound, designated isocoformycin, having the formula



4,163,840

PROCESS AND APPARATUS FOR MAKING ALKALI CELLULOSE IN SHEET FORM

Charles J. Geyer, Jr., Berwyn, and Ben E. White, Wayne, both of Pa., assignors to Fiber Associates, Inc., Berwyn, Pa.

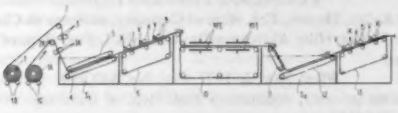
Filed May 9, 1975, Ser. No. 576,200

Int. Cl.² C08B *1/08, 1/10*

U.S. Cl. 536—101 10 Claims

1. Process for continuously making alkali cellulose and depolymerizing it to a desired degree of polymerization comprising first contacting a cellulose sheet of indefinite length with 17–25% alkali hydroxide solution, removing said sheet from said solution and pressing out caustic soda solution followed by a rapid depolymerization process to bring about desired depo-

lymerization of cellulose, said depolymerization process consisting of exposing said cellulose to RF energy for a period of



time and at an energy input level sufficient to accomplish said depolymerization.

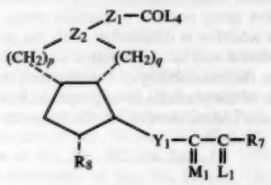
4,163,841

PYRIDYLAMIDES OF NITRILOPROSTACYCLINS

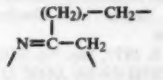
Gordon L. Bundy, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 807,514, Jun. 17, 1977, Pat. No. 4,097,489. This application Apr. 5, 1978, Ser. No. 893,587
Int. Cl.[2] C07D *213/50*
U.S. Cl. 542—421 **49 Claims**

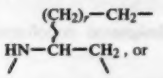
1. A prostacyclin analog of the formula



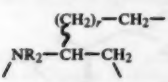
wherein R_8 is hydrogen, hydroxy, or hydroxymethyl
wherein Z_2 is



(1)

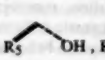


(2)



(3)

wherein R_2 is alkyl of one to 4 carbon atoms, inclusive, or alkylcarbonyl of one to 4 carbon atoms, inclusive;
wherein one of p, q, and r is the integer one and the other two are the integer zero;
wherein Z_1 is
(1) $-(CH_2)_g-CH_2-CH_2-$,
(2) $-(CH_2)_g-CH_2-CF_2-$, or
(3) trans$-(CH_2)_g-CH=CH-$,
wherein g is the integer zero, one, or 2;
wherein R_4 is hydrogen, hydroxy, or hydroxymethyl;
wherein Y_1 is
(1) trans—CH=CH—,
(2) cis—CH=CH—
(3) $-CH_2CH_2-$,
(4) trans—CH=C(Hal)—, or
(5) —C≡C—
wherein Hal is chloro or bromo;
wherein M_1 is



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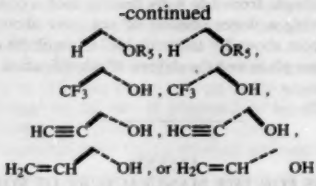
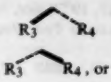
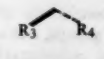


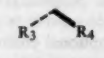
wherein R_5 is hydrogen or alkyl with one to 4 carbon atoms, inclusive
wherein L_1 is



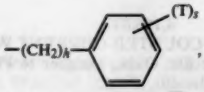
a mixture of



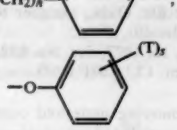
and



wherein R_3 and R_4 are hydrogen, methyl, of fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro;
wherein L_4 is amino of the formula $—NR_{21}R_{22}$, wherein one of R_{21} and R_{22} is
(i) pyridyl;
(ii) pyridyl substituted by one, 2, or 3 chloro, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive;
(iii) pyridylalkyl of one to 4 carbon atoms, inclusive; or
(iv) pyridylalkyl substituted by one, 2, or 3 chloro, alkyl of one to 3 carbon atoms, inclusive, hydroxy, alkoxy of one to 3 carbon atoms, inclusive;
and the other of R_{21} and R_{22} is hydrogen or alkyl of one to 12 carbon atoms, inclusive;
wherein R_7 is
(1) $-(CH_2)_m-CH_3$,



(2)



(3)

wherein m is the integer one to 5, inclusive, h is the integer zero to 3, inclusive; s is the integer zero, one, 2, or 3, and T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, or with the proviso that not more than two T's are other than alkyl; and the pharmacologically acceptable acid addition salts thereof when R_2 is not alkylcarbonyl.

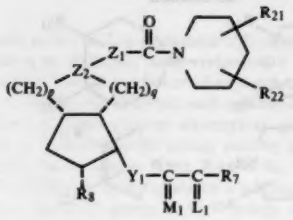
4,163,842

5-HYDROXY-PGI$_1$ PIPERIDYLAMIDES

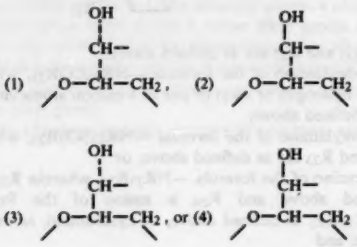
Roy A. Johnson, and John C. Sih, both of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 815,648, Jul. 14, 1977, Pat. No. 4,110,532. This application Apr. 24, 1978, Ser. No. 899,199
Int. Cl.[2] C07D *405/06, 405/02*
U.S. Cl. 542—426 **47 Claims**

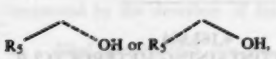
1. A prostacyclin analog of the formula



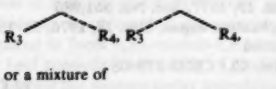
wherein Z_2 is



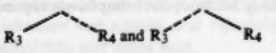
wherein one of p or q is the integer zero or one and the other is the integer zero;
wherein Z_1 is
(1) $-(CH_2)_g-CH_2-$,
(2) $-(CH_2)_g-CH_2-CF_2-$, or
(3) trans$-(CH_2)_g-CH=CH-$,
wherein g is the integer one, 2, or 3 when q is zero and zero, one, or 2 when q is one;
wherein R_8 is hydrogen, hydroxy, or hydroxymethyl;
wherein Y_1 is
(1) trans—CH=CH—,
(2) cis—CH=CH—,
(3) $-CH_2CH_2-$,
(4) trans—CH=C(Hal)—, or
(5) —C≡C—
wherein Hal is chloro or bromo;
wherein M_1 is



wherein R_5 is hydrogen or alkyl with one to 4 carbon atoms, inclusive:
wherein L_1 is

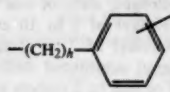


or a mixture of



wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro;
wherein R_{21} and R_{22} are hydrogen, alkyl of one to 12 carbon atoms, inclusive; aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, 2, or 3 chloro or alkyl of one to 3 carbon atoms, inclusive, or phenyl substituted with hydroxycarbonyl or alkoxycarbonyl of one to 4 carbon atoms, inclusive; and

wherein R_7 is
(1) $-(CH_2)_3-CH_3$,



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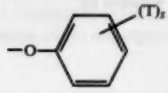


(3)

wherein h is the integer zero or one; s is the integer zero, one, 2, or 3; and T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or with the proviso that not more than two T's are other than alkyl.

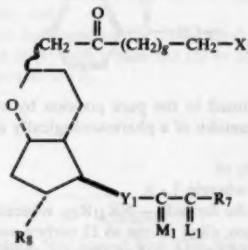
4,163,843

7A-HOMO-4-OXO-PGI$_1$ COMPOUNDS

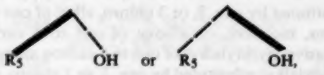
Donald E. Ayer, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 857,106, Dec. 5, 1977, Pat. No. 4,126,744. This application May 8, 1978, Ser. No. 904,188
Int. Cl.^{2} C07D *307/93*
U.S. Cl. 542—426 **43 Claims**

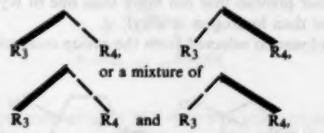
1. A prostacyclin analog of the formula



wherein ~ represents attachment of the side chain in the alpha or beta configuration or a mixture of alpha and beta configurations;
wherein g is the integer one, 2, or 3;
where R_8 is hydrogen, hydroxy, or hydroxymethyl;
wherein Y_1 is
(1) trans —CH=Ch—,
(2) cis —CH=CH—,
(3) $-CH_2CH_2-$, or
(4) —C≡C—,
wherein M_1 is



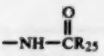
wherein R_5 is hydrogen or alkyl with one to 4 carbon atoms, inclusive,
wherein L_1 is

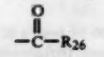


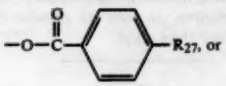
wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the

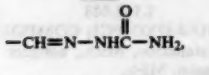
same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro;
wherein Z_1 is

(1) —$COOR_1$ wherein R_1 is hydrogen; alkyl of one to 12 carbon atoms, inclusive; cycloalkyl of 3 to 10 carbon atoms, inclusive; hydrocarbylaralkyl of 7 to 12 carbon atoms, inclusive; phenyl; phenyl substituted with one, two, or three chloro or alkyl of one to 3 carbon atoms; phenyl substituted in the para position by

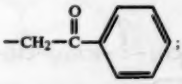

(a)


(b)


(c)


(d)

wherein R_{25} is methyl, phenyl, acetamidophenyl, benzamidophenyl, or —NH_2; R_{26} is methyl, phenyl, —NH_2, or methoxy; and R_{27} is hydrogen or acetamido; inclusive, phenacyl, i.e.,



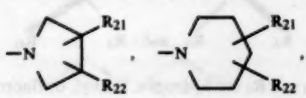
phenacyl substituted in the para position by chloro, bromo, phenyl, or benzamido; of a pharmacologically acceptable cation;

(2) —CH_2OH; or

(3) —COL_4, wherein L_4 is

(a) amino of the formula —$NR_{21}R_{22}$; wherein R_{21} and R_{22} are hydrogen; alkyl of one to 12 carbon atoms, inclusive; cycloalkyl of 3 to 10 carbon atoms, inclusive; aralkyl of 7 to 12 carbon atoms, inclusive; phenyl; phenyl substituted with one, 2, or 3 chloro, alkyl of one to 3 carbon atoms, inclusive, hydroxy, carboxy, alkoxycarbonyl of one to 4 carbon atoms, inclusive, or nitro; carboxyalkyl of one to 4 carbon atoms, inclusive; carbamoylalkyl of one to 4 carbon atoms, inclusive; cyanoalkyl of one to 4 carbon atoms, inclusive; acetylalkyl of one to 4 carbon atoms, inclusive; benzoylalkyl of one to 4 carbon atoms, inclusive; benzoylalkyl substituted by one, 2, or 3 chloro, alkyl of one to 3 carbon atoms, inclusive, hydroxy, alkoxy of one to 3 carbon atoms, inclusive, carboxy, alkoxycarbonyl of one to 4 carbon atoms, inclusive, or nitro; pyridyl; pyridyl substituted by one, 2, or 3 chloro, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms; inclusive; pyridylalkyl of one to 4 carbon atoms, inclusive; pyridylalkyl substituted by one, 2, or 3 chloro, alkyl of one to 3 carbon atoms, inclusive, hydroxy, or alkoxy of one to 3 carbon atoms, inclusive; hydroxyalkyl of one to 4 carbon atoms, inclusive; dihydroxyalkyl of one to 4 carbon atoms, and trihydroxyalkyl of one to 4 carbon atoms; with the further proviso that not more than one of R_{21} and R_{22} is other than hydrogen or alkyl;

(b) cycloamino selected from the group consisting of



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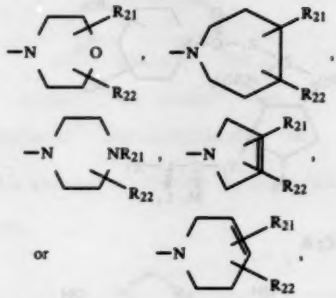


wherein R_{21} and R_{22} are as defined above;

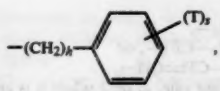
(c) carbonylamino of the formula —$NR_{23}COR_{21}$, wherein R_{23} is hydrogen or alkyl of one to 4 carbon atoms and R_{21} is as defined above;

(d) sulfonylamino of the formula —$NR_{23}SO_2R_{21}$, wherein R_{21} and R_{23} are as defined above; or

(e) hydrazino of the formula —$NR_{23}R_{24}$, wherein R_{23} is as defined above and R_{24} is amino of the formula —$NR_{21}R_{22}$, as defined above, or cycloamino, as defined above; and

wherein R_7 is

(1) —$(CH_2)_m$—CH_3,


(2)

(3)

wherein m is the integer one to 5, inclusive, h is the integer zero to 3, inclusive; s is the integer zero, one, 2, or 3, and T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, with the proviso that not more than two T's are other than alkyl.

4,163,844

NITROGEN-CONTAINING HETEROCYCLIC COMPOUNDS

Kazuo Kubo, Urawa; Noriki Ito, Iwatsuki; Isao Souzu, Urawa; Yasuo Isomura, Yokohama, and Hiroshige Homma, Omiya, all of Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

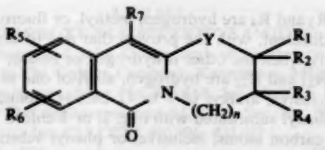
Filed Dec. 19, 1977, Ser. No. 861,980

Claims priority, application Japan, Dec. 28, 1976, 52/157867; Oct. 11, 1977, 52/121666

Int. Cl.² C07D *279/08*

U.S. Cl. 544—32 **12 Claims**

1. Nitrogen-containing heterocyclic compounds represented by the formula



wherein Y represents a sulfur atom, or a group shown by

wherein m is 1 or 2; n represents 1; R_1 and R_4, which may be the same or different, each represents a hydrogen atom, a lower alkyl group, or a lower alkenyl group; R_2 and R_3, which may be the same or different, each represents a hydrogen atom, a hydroxyl group, a lower alkanoyloxy group, a lower alkyl group or a lower alkenyl group; said R_2 and R_3 may further form together a double bond; R_5 and R_6, Which may be the same or different, each represents a hydrogen atom, a halogen atom, a hydroxyl group, a nitro group, an amino group, a lower alkoxy group, a mono or di lower alkylamino group, or a lower alkyl group; said R_5 and R_6 may further form together a lower alkylenedioxy group; and R_7 represents a hydrogen atom, a halogen atom, a lower alkanoyl group, a phenyl group, a phenyl lower alkyl group, a lower alkyl group, a hydroxy lower alkyl group, a di-lower alkylamino lower alkyl group, a pyrrolidino lower alkyl group, a piperidino lower alkyl group, a morpholine lower alkyl group, or a 4-lower alkylpiperazino lower alkyl group;

and the pharmacologically acceptable non-toxic salts thereof.

4,163,845

RECYCLE OF SPENT ACID IN NITROLYSIS OF HEXAMINE TO RDX

Charles D. Brumley, Greeneville, and John M. Staples, Kingsport, both of Tenn., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 26, 1978, Ser. No. 900,212
Int. Cl.[2] C07D *251/06*
U.S. Cl. 544—215 **6 Claims**

1. A process for producing 1,3,5-trinitro-1,3,5-triazacyclohexane, by nitrolysis of hexamine, which comprises:

(a) introducing a solution of hexamine in acetic acid, a solution of ammonium nitrate in nitric acid, and acetic anhydride in stoichiometric excess over the proportions required to form 1,3,5-trinitro-1,3,5-triazacyclohexane, into a heel consisting essentially of acetic acid;

(b) heating the mixture under anhydrous conditions to effect nitrolysis and production of 1,3,5-trinitro-1,3,5-triazacyclohexane and a spent acid containing acetic acid, acetic anhydride, and nitric acid;

(c) adding water to said spent acid- 1,3,5-trinitro-1,3,5-triazacyclohexane mixture sufficient to eliminate the acetic anhydride contained therein and adjust the water content of between 0% and about 2%;

(d) simmering the mixture to destroy linear nitramines;

(e) separating the 1,3,5-trinitro-1,3,5-triazacyclohexane from the spent acid; and

(f) recycling at least part of said spent acid containing nitric acid and 0–2% water to dissolve the hexamine reactant.

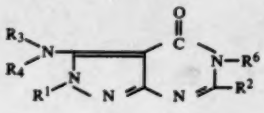
4,163,846

SUBSTITUTED PYRAZOLOPYRIMIDINE COMPOUNDS

Albert Percival, and Philip N. Judson, both of Cambridge, England, assignors to Fisons Limited, London, England

Filed May 13, 1977, Ser. No. 796,827
Claims priority, application United Kingdom, May 15, 1976, 20147/76
Int. Cl.[2] C07D *487/04*; A01N *9/22*
U.S. Cl. 544—262 **10 Claims**

1. A substituted pyrazolopyrimidine selected from the group consisting of (1) a compound of the formula



wherein

R^1 represents hydrogen, C_1 to C_6 alkyl, C_3 to C_7 cycloalkyl or phenyl,

R^2 represents hydrogen, C_1 to C_6 alkyl, C_1 to C_6 haloalkyl or phenyl,

R^3 and R^4 are the same or different and represent hydrogen, C_1 to C_6 alkyl, C_1 to C_6 alkanoyl, or together represent benzylidene, and

R^6 represents hydrogen or C_1 to C_6 alkyl, (2) a salt of a compound of (1) with a base and (3) an acid addition salt of a compound of (1).

4,163,847

Patent Not Issued For This Number

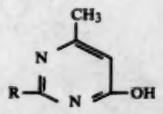
4,163,848

PROCESS FOR THE PRODUCTION OF 2-ALKYL- OR CYCLOALKYL-4-METHYL-6-HYDROXYPYRIMIDINES

Joseph T. Blackwell, III, Greensboro; John T. Gupton, Jamestown; Teruko U. Miyazaki, Greensboro, all of N.C.; James B. Nabors, Baton Rouge, La., and Joseph R. Pociask, Greensboro, N.C., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

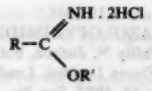
Filed Aug. 8, 1978, Ser. No. 932,087
Int. Cl.[2] C07D *239/36*
U.S. Cl. 544—319 **18 Claims**

1. A method for the preparation of 2-alkyl-4-methyl-6-hydroxypyrimidine of the formula



where R represents an alkyl of 1–4 carbon atoms or a cycloalkyl of 3 to 6 carbon atoms which comprises the steps of:

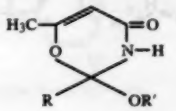
(a) neutralizing an imidate hydrochloride of the formula



where R′ is an alkyl of 1–4 carbon atoms, with a strong acid-accepting base in aqueous solution in the presence of a water-immiscible solvent to form the free imidate;

(b) removing the aqueous phase and any residual water from the solvent/imidate solution phase;

(c) adding a molar equivalent of a solution of diketene in the presence of a Lewis-base or Lewis-acid as catalyst to form an oxazinone of the formula



(d) adding gaseous ammonia to said oxazinone solution to form said hydroxypyrimidine;

(e) removing any water formed in step (d); and

(f) removing said solvent and recovering the 2-alkyl-4-methyl-6-hydroxypyrimidine.

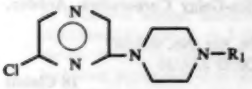
4,163,849

PIPERAZINYLPYRAZINES

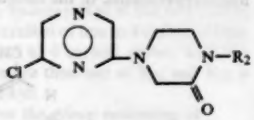
William C. Lumma, Jr., Pennsburg; Walfred S. Saari, Lansdale, and Anthony G. Zacchei, Ambler, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Mar. 17, 1978, Ser. No. 887,693
Int. Cl.[2] A61K *31/495*; C07D *403/04*
U.S. Cl. 544—357 **6 Claims**

1. A compound of the formula:



or



wherein R_1 is allyl, cyclopropyl, cyclopropylalkyl of 4–6 carbon atoms or propaniminooxycarbonyl and R_2 is alkyl of 1–4 carbon atoms and the pharmaceutically acceptable salts thereof.

4,163,850

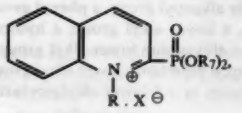
POLYCYCLIC FULL QUATERNARY NITROGEN-HETEROCYCLIC PHOSPHONATES

Derek Redmore, Ballwin, Mo., assignor to Petrolite Corporation, St. Louis, Mo.

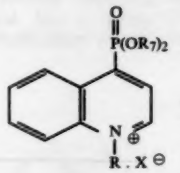
Continuation of Ser. No. 380,605, Jul. 19, 1973, abandoned, which is a division of Ser. No. 117,082, Feb. 19, 1971, Pat. No. 3,770,750. This application Dec. 15, 1977, Ser. No. 860,820
Int. Cl.[2] C07F *9/60, 9/62*
U.S. Cl. 546—21 **7 Claims**

1. A full quaternary nitrogen-heterocyclic phosphonate selected from the group consisting of

(1)



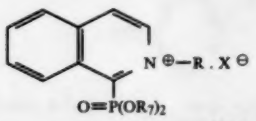
(2)



a mixture of (1) and

and

(3)



where R and R_7 are each alkyl and X is an anion.

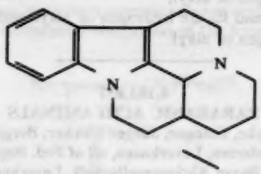
4,163,851

3α,16α-14,15-DIHYDROEBURNAMENINE

Otto Clauder; Árpád Király; Jozsef Kókósi; Egon Kárpati, and László Szporny, all of Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyar RT, Budapest, Hungary

Filed Jul. 6, 1977, Ser. No. 813,227
Claims priority, application Hungary, Jul. 21, 1976, RI 592
Int. Cl.[2] C07D *519/04*
U.S. Cl. 546—51 **3 Claims**

1. Vincane of the formula:



or a pharmaceutically acceptable acid-addition or quaternary salt thereof.

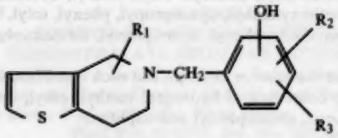
4,163,852

PROCESS FOR THE PREPARATION OF TETRAHYDRO-THIENO[3,2-c]- AND [2,3-C]PYRIDINE DERIVATIVES

Gérard Ferrand, and Jean-Pierre Maffrand, both of Toulouse, France, assignors to Parcor, Paris, France

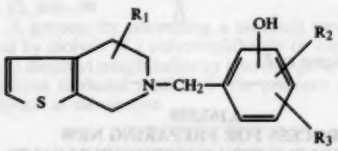
Continuation of Ser. No. 689,928, May 25, 1976, abandoned. This application Dec. 13, 1977, Ser. No. 860,188
Claims priority, application France, Jul. 9, 1975, 75 21549
Int. Cl.[2] C07D *495/04*
U.S. Cl. 546—114 **3 Claims**

1. Process for the preparation of derivatives selected from the group consisting of the tetrahydro-thieno(3,2-c)pyridine derivatives of the formula:



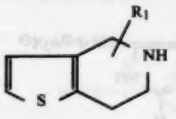
(Ia)

and their isomeric pyridine derivatives of the formula:



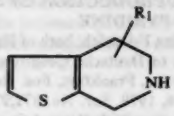
(Ib)

in which the hydroxyl radical is at the 2-position; R_1 is hydrogen; R_2 is hydrogen; and R_3 is selected from the group consisting of hydrogen, halogen, lower alkyl, lower alkoxy and nitro; comprising reacting in an organic solvent at a temperature between 50° C. and the boiling temperature of the solvent a derivative selected from the group consisting of the tetrahydro-thieno(3,2-c)pyridine derivatives of the formula:



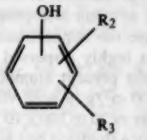
(IIa)

and their isomeric tetrahydro-thieno(2,3-c)pyridine derivatives of the formula:



(IIb)

in which R_1 is hydrogen, with formaldehyde and a phenol of the formula:



(III)

in which R_2 and R_3 have the above-defined meanings, to give the desired derivative selected from the pyridine derivatives of the formulae (Ia) and (Ib).

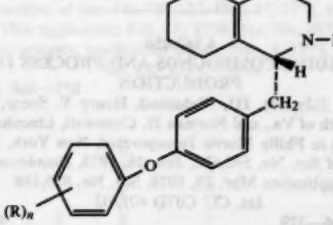
4,163,853

1-(P-PHENOXY)BENZYL-1,2,3,4,5,6,7,8-OCTAHYDROISOQUINOLINES

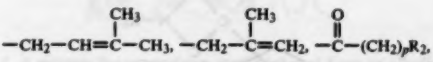
Ernest Mohacsi, Nutley, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 811,233, Jul. 29, 1977, Pat. No. 4,113,729, which is a continuation-in-part of Ser. No. 748,022, Dec. 6, 1976, abandoned. This application May 5, 1978, Ser. No. 903,273
Int. Cl.[2] C07D *217/20*
U.S. Cl. 546—149 **2 Claims**

1. The compound of the formula:



wherein R is halo, hydroxy nitro, methyl, ethyl, n-propyl, methoxy, ethoxy or hydrogen, R_1 is hydrogen, methyl, ethyl, n-propyl, vinyl, $-CH_2-CH=CH_2$,



and $-CH_2(CH_2)_pR_2$; R_2 is phenyl or cyclo-lower alkyl having from 3 to 6 carbon atoms; p is an integer from 0 to 3; n is an integer of from 1 to 3.

4,163,854

PROCESS FOR THE PRODUCTION OF 3-METHYL PYRIDINE

Helmut Beschke, and Heinz Friedrich, both of Hanau, Fed. Rep. of Germany, assignors to Deutsche Gold- und Silber Scheideanstalt vormals Roessler, Frankfurt, Fed. Rep. of Germany

Filed Jan. 24, 1978, Ser. No. 871,979

Claims priority, application Fed. Rep. of Germany, Jan. 26, 1977, 2703070

Int. Cl.[2] C07D *213/12*

U.S. Cl. 546—251 19 Claims

1. In a process for the production of 3-methyl pyridine by the catalytic reaction of acrolein and propionaldehyde with ammonia in the gas phase the improvement comprising employing as the catalyst a highly dispersed aluminum silicate containing 3 to 30 weight percent aluminum oxide, a BET surface area of 200 to 800 m^2/g, a pore volume of 0.4 to 1.0 cm^3/g and a pore diameter of 20 to 100×10^{-8} cm and wherein the catalyst is employed in a fluidized bed and the acrolein and propionaldehyde are introduced into the reactor separately from the ammonia.

4,163,855

AZETIDINE COMPOUNDS AND PROCESS FOR PRODUCTION

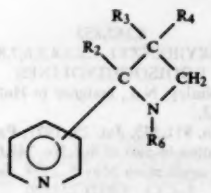
Henry V. Secor, Midlothian, and William B. Edwards, III, Richmond, both of Va., assignors to Philip Morris Incorporated, New York, N.Y.

Division of Ser. No. 590,646, Jun. 26, 1975, abandoned. This application Mar. 23, 1978, Ser. No. 889,147

Int. Cl.[2] C07D *401/02*

U.S. Cl. 546—329 4 Claims

1. An azetidine compound having the formula



wherein:

R_2 is hydrogen or alkyl;

each of R_3 and R_4 are hydrogen or alkyl; and

R_6 is hydrogen or alkyl.

4,163,856

AZETIDINE COMPOUNDS AND PROCESS FOR PRODUCTION

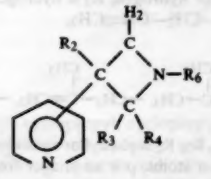
William B. Edwards, III, Richmond; Henry V. Secor, Midlothian, both of Va., and Norman H. Cromwell, Lincoln, Nebr., assignors to Philip Morris Incorporated, New York, N.Y.

Division of Ser. No. 590,670, Jun. 26, 1975, abandoned. This application Mar. 23, 1978, Ser. No. 889,188

Int. Cl.[2] C07D *401/02*

U.S. Cl. 546—329 4 Claims

1. An azetidine compound having the formula



wherein:

R_2 is hydrogen or alkyl;

Each of R_3 and R_4 are hydrogen or alkyl; and

R_6 is hydrogen or alkyl.

4,163,857

PARABANIC ACID AMINALS

Henning Giesecke, Cologne; Jürgen Hocker, Bergisch Gladbach, and Rudolf Merten, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

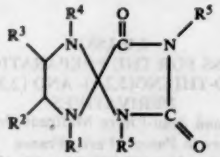
Continuation-in-part of Ser. No. 804,607, Jun. 8, 1977, abandoned. This application Jul. 28, 1977, Ser. No. 819,870

Claims priority, application Fed. Rep. of Germany, Jun. 9, 1976, 2625722

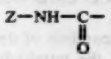
Int. Cl.[2] C07D *233/02*

U.S. Cl. 548—318 10 Claims

1. Parabanic acid aminal of the formula



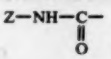
wherein R^1 is hydrogen or



wherein Z is selected from the group consisting of alkyl having 1–5 carbon atoms, allyl, dodecyl, oleyl, stearyl, cyclohexyl, chloroethyl, methoxymethyl, cyanopropyl, phenyl, tolyl, benzyl, chlorophenyl, nitrophenyl, cyanophenyl, methoxyphenyl and naphthyl;

R^2 and R^3 are the same or different and each is selected from the group consisting of hydrogen, methyl, ethyl, cyclohexyl, phenyl, chlorophenyl and naphthyl;

R^4 is



and R^5 is the same as Z.

4,163,858

PROCESS FOR PREPARING NEW IMIDAZOLEMETHYLPHOSPHONIUM SALTS

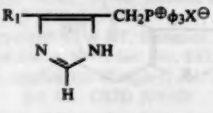
Clifford S. Labaw, Philadelphia; Robert L. Webb, West Chester, and George R. Wellman, Warminster, all of Pa., assignors to SK&F Lab Co., Carolina, P.R.

Division of Ser. No. 800,150, May 24, 1977, Pat. No. 4,104,472, which is a continuation-in-part of Ser. No. 767,083, Feb. 9, 1977, abandoned. This application Mar. 8, 1978, Ser. No. 884,658

Int. Cl.[2] C07D *231/14*

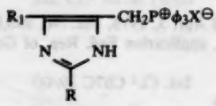
U.S. Cl. 548—342 3 Claims

1. The method of preparing compounds of the formula:



in which:

R_1 is hydrogen, lower alkyl of 1–6 carbons or phenyl; and $X^{\ominus}$ is chloride or bromide, or its acid addition salts, comprising heating in an inert organic solvent until the evolution of gas is complete a compound of the formula:



in which R_1 and $X^{\ominus}$ are as defined above and
R is $—SO_2H$ or carbo-lower-alkoxy; or its acid addition salts.

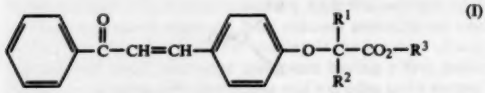
4,163,859

PHENOXYLDIALKYL ACETIC ACIDS AND ESTERS

William K. Sprenger, deceased, late of Arlington Heights, Ill. (by Barbara A. Sprenger, personal representative), assignor to G. D. Searle & Co., Skokie, Ill.

Filed Jul. 18, 1977, Ser. No. 816,237
Int. Cl.² C07C *65/20, 69/95;* A61K *31/19, 31/235*
U.S. Cl. 560—53 **3 Claims**

1. A compound of the formula



(I)

wherein R^1 and R^2 are independently an alkyl radical containing from 1 to 2 carbon atoms, and R^3 is hydrogen or an alkyl radical containing from 1 to 7 carbon atoms, sodium, potassium, or ammonium cation.

4,163,860

PROCESS FOR OBTAINING DIMETHYL TEREPHTHALATE FROM POLYESTER SCRAP

Jacques Delattre, Ste-Foy-les-Lyon; Roland Raynaud, Villeurbanne, and Claude Thomas, Brignais, all of France, assignors to Rhone-Poulenc-Textile, Paris, France

Filed Dec. 8, 1976, Ser. No. 748,540
Claims priority, application France, Dec. 16, 1975, 75 38775; Oct. 26, 1976, 76 32484
Int. Cl.² C07C *69/82*
U.S. Cl. 560—96 **14 Claims**

1. A process for converting a bis-(diol) terephthalate obtained by diolysis of a polyterephthalate or copolyterephthalate, to dimethyl terephthalate by interchange in a substantially anhydrous methanol medium in the presence of magnesium methylate as the catalyst.

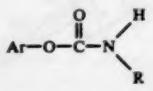
4,163,861

PROCESS FOR THE PREPARATION OF AROMATIC URETHANES

Gabriello Illuminati, Rome, and Ugo Romano, Milan, both of Italy, assignors to Snamprogetti S.p.A., Milan, Italy

Continuation of Ser. No. 589,898, Jun. 24, 1975, abandoned. This application Nov. 15, 1977, Ser. No. 851,739
Int. Cl.² C07C *67/08*
U.S. Cl. 560—132 **4 Claims**

1. The process of preparing an aromatic urethane having the formula:



wherein Ar is a phenyl or naphthyl group and R is alkyl, which consists in reacting the corresponding alkyl carbamate ester with a phenol or naphthol corresponding to Ar, in the liquid phase and in the presence of a catalyst consisting of $AlCl_3$ or $ZnCl_2$ under subatmospheric conditions in the temperature range of 100° to 300° C.

4,163,862

PREPARATION OF UNSATURATED ACIDS

Serge R. Dolhyj, Parma, and Ernest C. Milberger, Solon, both of Ohio, assignors to Standard Oil Company (Ohio), Cleveland, Ohio

Continuation of Ser. No. 507,499, Sep. 13, 1974, which is a division of Ser. No. 409,693, Oct. 25, 1973, abandoned. This application Jan. 30, 1976, Ser. No. 653,853
Int. Cl.² C07C *51/32, 57/04*
U.S. Cl. 562—534 **8 Claims**

1. In the process for the production of acrylic acid or methacrylic acid by contacting acrolein or methacrolein with molecular oxygen in the presence of steam and a catalyst at a temperature of 200° to about 500° C., the improvement comprising using as the catalyst a catalyst composition having the empirical formula:

$$A_aCe_bW_cV_dMo_eO_x$$

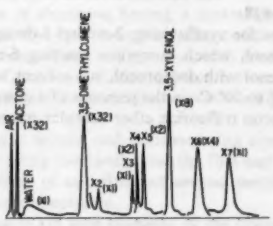
wherein
A is Fe, Co, Ni, Zn, Cu, Mg, Mn, Bi, Ti, Zr, Sn, an alkali metal, an alkaline earth metal, lanthanum, an element of the lanthanoid series or mixture thereof;
and wherein
a is 0 to about 5;
b, c and d are about 0.1 to about 10;
e is a number of about 6 to about 16; and
x is the number of oxygens required to satisfy the valence requirements of the other elements present.

4,163,863

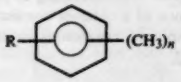
PROCESS FOR PREPARING A METHYLPHENOL

Takeo Ikarashi, Niigata; Mikio Goto; Kozo Sano, both of Matsudo; Naoto Osaki, Tokyo; Tetsuo Aoyama, Niigata, and Shigeru Horie, Tokyo, all of Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Continuation of Ser. No. 736,127, Oct. 27, 1976, abandoned. This application Feb. 15, 1978, Ser. No. 877,890
Claims priority, application Japan, Nov. 4, 1975, 50-132273
Int. Cl.² C07C *39/06*
U.S. Cl. 568—798 **14 Claims**

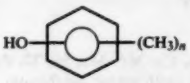


1. A process for preparing a methylphenol from an alkylbenzene which comprises oxidizing in the liquid phase an alkylbenzene having one secondary alkyl group, one to three methyl groups, and the formula (I):



(I)

where R is a secondary alkyl group having from three to four carbon toms and n is an integer from one to three, inclusive, by contacting the alkylbenzene with molecular oxygen to provide an oxidation product solution containing tertiary hydroperoxide and primary hydroperoxide; acid-decomposing from 84 to 90 percent of the hydroperoxides in the presence of catalytic quantities of a mineral acid catalyst and terminating the acid decomposition by removing the acid catalyst with an alkali neutralizer or an ion-exchange resin when the aforesaid percentage of hydroperoxides is decomposed to provide a neutralized acid decomposition product; hydrogenating the acid decomposition product so obtained at a temperature of 50° to 200° C. under a pressure of 0 to 50 kg/cm^3 (gauge) for 0.2 to ten hours in the presence of a hydrogenation catalyst which is copper, chromium or a metal from Group VIII of the Periodic Table of Elements to reduce the quantity of hydroperoxides; and recovering from the hydrogenation product methylphenol of the formula (II):



(II)

where n is as set forth above.

4,163,864

PROCESS FOR PREPARING 2-METHYL-3-PRENYL-4,5,6-TRIMETHOXYPHENOL

Eiichi Morita; Hirosaburo Ejiri, both of Saitama; Keizo Takayanagi, Isezaki; Yukio Morita; Yasuhide Tanaka, both of Saitama; Shizumasa Kijima, Tokyo; Kimio Hamamura, Chiba, and Isao Yamatsu, Saitama, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

Filed Feb. 16, 1978, Ser. No. 878,470

Claims priority, application Japan, Mar. 7, 1977, 52-23901

Int. Cl.^{2} C07C *41/00*

U.S. Cl. 568—628 **2 Claims**

1. A process for synthesizing 2-methyl-3-decaprenyl-4,5,6-trimethoxyphenol, which comprises reacting 6-methyl-2,3,4-trimethoxyphenol with decaprenol, in a solvent, at a temperature of from 0° to 50° C., in the presence of a complex catalyst comprising boron trifluoride ether complex mixed with silica alumina.

4,163,865

PROCESS FOR THE PREPARATION OF PINACOLS

Heinrich Wolfers, Rheurdt; Hans Rudolph, and Hans-Jurgen Rosenkranz, both of Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

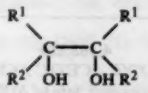
Filed Apr. 3, 1978, Ser. No. 893,097

Claims priority, application Fed. Rep. of Germany, Apr. 22, 1977, 2718104

Int. Cl.^{2} C07C *29/00*

U.S. Cl. 568—640 **15 Claims**

1. An improvement in a process for the preparation of a pinacol of the formula



wherein

R^1 and R^2 are identical or different and represent optionally substituted aliphatic, cycloaliphatic, araliphatic or an aromatic hydrocarbon radical

by reducing a ketone of the formula

wherein

R^1 and R^2 have the abovementioned meanings with a base metal, the improvement comprising carrying out the reduction in the presence of an organic halogen compound and in the presence of a phosphoric acid amide, phosphoric acid ester and/or carboxylic acid amide.

4,163,866

PROCESS FOR THE PREPARATION OF A BICYCLIC ALCOHOL

Hugo Strickler, Dardagny, Switzerland, assignor to Firmenich SA, Geneva, Switzerland

Filed Jul. 12, 1977, Ser. No. 814,860

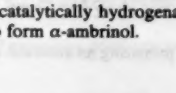
Claims priority, application Switzerland, Jul. 28, 1976, 9634/76

Int. Cl.^{2} C07C *29/00, 33/02*

U.S. Cl. 568—819 **4 Claims**

1. Process for the preparation of α-ambrinol which comprises the steps of:

(a) subjecting β-ionone to a thermal treatment at a temperature of between about 300° to 500° C. to give a dehydroambrinol of formula



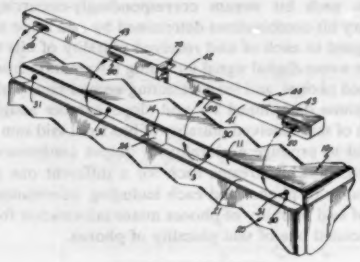
(b) subsequently catalytically hydrogenating the said dehydroambrinol to form α-ambrinol.

4,163,867

WIRING ACCESS SYSTEM FOR DESKS AND THE LIKE

James H. Breidenbach, Sturgis, Mich., assignor to Steelcase Inc., Grand Rapids, Mich.

Filed Jun. 20, 1977, Ser. No. 807,901
Int. Cl.[2] A47B 13/00
U.S. Cl. 174—48 13 Claims



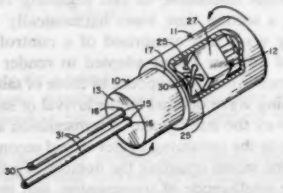
5. In a desk, table or the like with a top having an exterior surface, an interior surface and an edge, and with a side panel having an exterior surface, an interior surface and an edge, an improved wiring access system comprising; said side panel being oriented with respect to said top such that said top edge and said side panel edges are both exposed and adjacent one another; an edge trim piece for locating at the juncture of said top and side panel, said edge trim piece having a first inside surface for aligning with and facing said top edge and a second inside surface for aligning with and facing said side panel edge whereby when said edge trim piece is in position at the juncture of said top and side panel, said top edge and said side panel edge are concealed from view; releasable securing means on said edge trim piece and on at least one of said top and side panel for releasably securing said edge trim piece thereto; a large access opening through at least one of said top and side panel, said large access opening extending from said edge through to said interior surface of said one of said top and side panel, but not extending through said exterior surface of said one of said top and side panel whereby said large access opening is normally covered by said trim piece; said large access opening being large enough to allow a user to readily feed wiring with large connectors therethrough; said edge trim piece including a relatively smaller access opening for allowing wiring to pass therethrough, said relatively smaller access opening being much less noticeable than said large access opening would be, and said relatively smaller opening including an open side facing said large access opening whereby it can be fitted over wiring or the like without the necessity of feeding large connectors or the like therethrough.

4,163,868

WIRE CONNECTOR

Hugh D. Stotts, NE. 305 Ash St., Pullman, Wash. 99163

Filed Jun. 2, 1978, Ser. No. 912,036
Int. Cl.[2] H01R 5/08; B21F 7/00, 15/04
U.S. Cl. 174—87 4 Claims



1. A permanent wire connector that automatically removes insulation from an insulated wire type conductor during the connecting process, comprising, in combination:

a base having means of unidirectional rotatable communication with a cap and defining at least two spaced conductor holes having axes substantially parallel to and at a spaced distance from the axis of rotation of the base relative to a cap; and

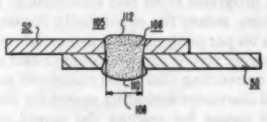
a cap carried by the base for unidirectional rotatable motion relative thereto, said cap defining an insulation cutter chamber communicating with the conductor holes defined in the base and irrotatable carrying therein for slidable motion in the insulation cutter chamber an insulation cutter defining at least two spaced conductor holes axially alignable with the conductor holes defined in the base, said insulation cutter conductor holes each having an annular, inwardly extending cutter structure to cut and strip insulation from conductors carried therein upon rotary motion of the cap relative the base.

4,163,869

ELECTRICAL CONNECTION BETWEEN ALUMINUM CONDUCTORS

John Z. Almand, III, Marietta; Henry F. Benner, Athens, both of Ga., and William J. Reichenecker, Penn Hills Borough, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 2, 1977, Ser. No. 847,865
Int. Cl.[2] H01R 5/04
U.S. Cl. 174—94 R 2 Claims



1. An electrical conductor connection, comprising:

first and second aluminum conductor members each having first and second major opposed flat surfaces, and each having a thickness dimension of at least 0.100 inch,

said first and second metallic conductor members being lapped with at least a portion of their second and first major flat surfaces, respectively, in contact with one another,

and a fusion of aluminum joining said lapped first and second aluminum conductor members,

said fusion of aluminum having a central portion fused to both said first and second metallic conductor members, and first and second end portions, with the diameter of the fusion of aluminum at the interface between the first and second aluminum conductor members being at least 0.375 inch,

said first and second end portions being convexly cupped and extending outwardly past the first and second major flat surfaces of said first and second metallic conductor members, respectively,

said at least 0.375 inch diameter of the connecting central portion of the fusion of aluminum at said interface being the minimum diameter of the fusion of aluminum measured at any point between the first and second major flat surfaces of the first and second metallic conductor members, in a direction parallel with their major flat surfaces.

4,163,870

CIRCUIT FOR PRODUCING A PULSE SUCCESSION

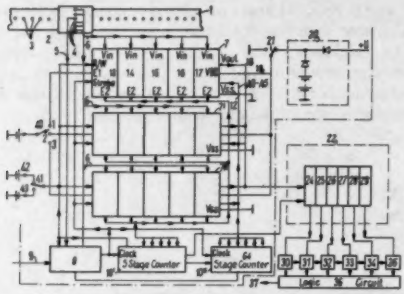
Siegmund Kreil, Stockdorf; Achim Zech, Weidach, and Reinhard Hergert, Neuried, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Sep. 22, 1972, Ser. No. 293,664

Claims priority, application Fed. Rep. of Germany, Nov. 15, 1971, 2156635

Int. Cl.[2] H04L *17/02*

U.S. Cl. 178—26 R 10 Claims



1. A circuit for producing a pulse succession of long duration from several mutually independently produced synchronous pulse successions of shorter duration, comprising: a plurality of separate generators for producing the respective mutually independent synchronous pulse successions; a logic circuit connected to said generators for logically combining the outputs thereof to provide said pulse succession of long duration; a common information carrier storing respective pulse succession programs for each of said generators; a sensing device for serially and contemporaneously reading the respective programs from said information; means for storing the programs; means for sequentially reading the stored programs on a bit per program basis as a serial composite program; a series-parallel converter connected to said sequential reading means for converting said series composite program to parallel codes, said converter including means for storing said parallel codes; and means for reading the stored parallel codes and adjusting the operation of said plurality of generators in response thereto.

4,163,871

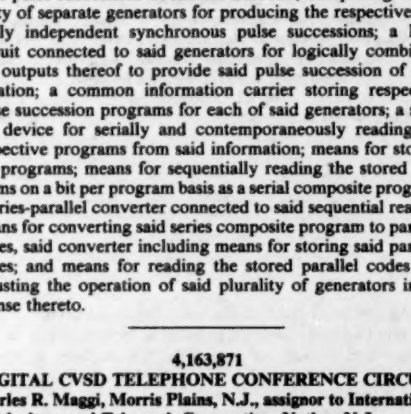
DIGITAL CVSD TELEPHONE CONFERENCE CIRCUIT

Charles R. Maggi, Morris Plains, N.J., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Dec. 22, 1977, Ser. No. 863,377

Int. Cl.[2] H04M *3/56*

U.S. Cl. 179—1 CN 37 Claims



1. An all digital delta modulation telephone conference circuit comprising:

first digital means to separately store in succession a plurality of sequential bits in each of a plurality of input delta modulation bit streams each originating from a different one of a plurality of phones, each of said plurality of bits being capable of having a plurality of different bit combinations, each of said plurality of different bit combinations being assigned a predetermined slope number, wherein said slope number indicates slope information of an analog signal represented by each of said plurality of streams; and

second digital means coupled to said first means for sequentially receiving each of said plurality of bits, for adding from each bit stream correspondingly-occurring first binary bit combinations determined by said slope number assigned to each of said received plurality of bits to produce a sum digital signal including information from each of said phones, and for subtracting second binary bit combinations determined by said slope number assigned to each of said received plurality of bits from said sum digital signal to produce a plurality of output conference delta modulation bit streams each for a different one of said plurality of phones and each including information from all of said plurality of phones minus information from the associated one of said plurality of phones.

4,163,872

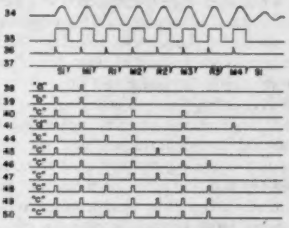
SECRET PULSE SIGNALING SYSTEM

Ernst H. Krause, Cheverly, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 28, 1945, Ser. No. 602,148

Int. Cl.[2] H04K *1/10*

U.S. Cl. 179—1.5 R 3 Claims

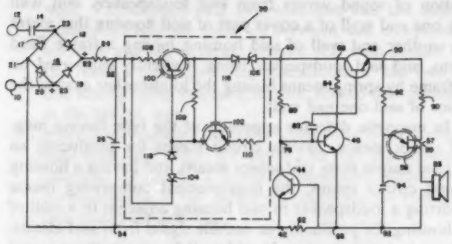


1. A radio pulse signalling system comprising, oscillator means generating a first timing wave which is comprised of a controlled number of cycles, means transmitting a pulse signal at the start of said timing wave, means transmitting a selectable number of pulse signals in response to only certain of said cycles in said timing wave so as to thereby convey the intelligence of transmission, means transmitting a pulse signal in response to a random number of the remaining cycles in said timing wave so as to thereby dissemble the intelligence of transmission, means receiving said pulse signals at a remote point, pulse generator means producing in response to the first received pulse signal a controlled number of regularly recurrent pulses the periodicity of which is harmonically related to said timing wave, vacuum tube means responsive to the first of said recurrent pulses holding said receiving means operative only prior to the production of said first recurrent pulse, counter means responsive to said regularly recurrent pulses generating a second time wave harmonically related to said first timing wave and comprised of a controlled number of cycles, said counter means adapted to render said receiving means operative only in response to those of said cycles of said second timing wave defined by the arrival of said pulse signals which convey the intelligence of transmission and inoperative in response to the remaining cycles of said second timing wave, vacuum tube means counting the number of pulse signals conveying the intelligence of transmission, and means recording the count of last said vacuum tube means whereby the intelligence of transmission is reproduced.

4,163,873
TELEPHONE SOLID STATE RINGER

Robert J. Phelps, Fountain Valley, Calif., assignor to Telephonic Equipment Corporation, Santa Ana, Calif.

Filed Aug. 9, 1977, Ser. No. 823,118
Int. Cl.² H04M *1/26*
U.S. Cl. 179—84 T 9 Claims



9. A solid state ringer comprising:

a terminal connecting point for connection to a telephone line including capacitance means for isolating direct current from said telephone line;

voltage storage means electrically connected to said terminal connecting point;

switching means connected to said voltage storage means comprising a plurality of transistors wherein one of said transistors is in the off condition and is changed to an on condition when the voltage across a resistor reaches a certain limit within a loop including said voltage storage means;

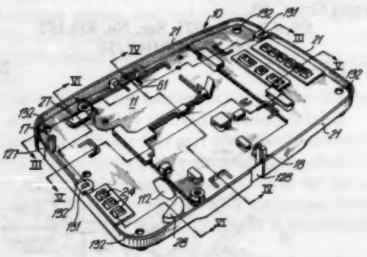
a unijunction transistor connected to said switching means; and,

for emanating an audible tone when said switch means allows current to flow from said voltage storage means to said unijunction transistor.

4,163,874
MOLDED PLASTIC BASE PLATE FOR A TELEPHONE SET

George V. Lenaerts, and Algirdas J. Dragunevicius, both of London, Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed May 11, 1978, Ser. No. 904,739
Int. Cl.² H04M *1/02*
U.S. Cl. 179—100 R 9 Claims



1. A base plate for a telephone set, comprising:

a molded plastic member having a base web and an upwardly extending rim around the periphery of the base web;

a plurality of integrally molded projections extending upwardly from said base web each projection including a top portion spaced from and extending parallel to a surface of said base web to form an undercut;

a plurality of integrally molded cantilevered deflectable members in said base web, each member including a rib at a free end thereof, said rib extending above said surface of said base web;

said projections and said deflectable members defining a plurality of mounting positions for mounting telephone set items, each position including at least two of said projections and at least one of said deflectable members;

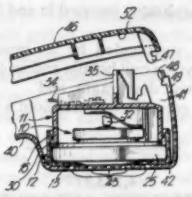
the arrangement such that a telephone set item can be mounted at each said position by a sequential sliding and downward movement to engage a part of said item under said undercuts and to initially deflect said deflectable member by pressing down on said rib whereby said item slides over the rib, said deflectable member returning to an initial undeflected position with said rib engaging with said item when said item is in a final position to maintain said item in said final position; and

alternative locating and mounting means at at least one of said positions for mounting an alternate form of item at said position by separate attachment members.

4,163,875
TELEPHONE HANDSET WITH TRANSMITTER HAVING A ONE PIECE GASKET FOR SEALING AND HOLDING OF TRANSMITTER MEMBERS

Fredrick T. Cogan, London, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Feb. 9, 1978, Ser. No. 876,262
Int. Cl.² H04M *1/04*
U.S. Cl. 179—103 7 Claims



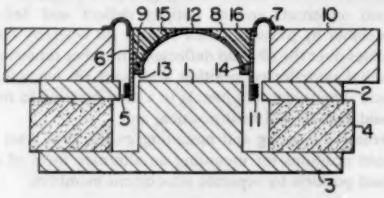
1. A telephone handset having an elongate top part and an elongate lower part, each part of hollow concave form and adapted to fit together at their peripheries, said lower part housing a receiver and a transmitter, said lower part formed at one end to define a circular recess having a perforated base and a side wall extending upward from said base, and a transmitter assembly in said recess, said transmitter assembly comprising: a transmitter having a front face facing towards and in close proximity to said base, a cup-shaped member positioned on the back of the transmitter and including an outwardly projecting rim at a front end, and a resilient tubular member surrounding the transmitter and the lower part of the cup-shaped member, said tubular member including a first radially inward projecting rim at a forward end extending over the periphery of the front face of the transmitter and having a front face in contact with said perforated base, at least one projection extending upward from a top surface of said cup-shaped member, said top part of said handset in pressure contact with an upper end of said projection whereby said front face of said first radially inward projecting rim is in deformed acoustically sealing pressure contact between said front face of said transmitter and said perforated base, and a second radially inward extending rim at a rear end engaging over said outwardly projecting rim of the cup-shaped member, to retain said transmitter and said cup-shaped member together and acoustically sealing between said transmitter and said cup-shaped member.

4,163,876

ELECTRO-ACOUSTIC TRANSDUCER WITH VARIABLE THICKNESS FOAM SURFACED DIAPHRAGM

Nobutaka Ohnuki, Yokohama, Japan, assignor to Hitachi, Ltd., Japan

Filed Jul. 5, 1978, Ser. No. 921,907
Claims priority, application Japan, Jul. 6, 1977, 52-79849
Int. Cl.[2] H04R 7/02, 9/02
U.S. Cl. 179—115.5 R 5 Claims



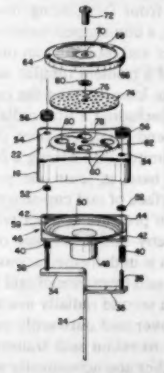
1. An electro-acoustic transducer comprising:
an inner pole piece,
an outer pole piece disposed concentrically to said inner pole piece to define a ring-shaped air gap between itself and said inner pole piece,
a magnet magnetically coupled to said inner pole piece and said outer pole piece for supplying magnetic flux to said air gap,
a cylindrical voice coil bobbin having a voice coil wound around an outer circumference thereof and inserted in said air gap,
a support member for supporting said voice coil bobbin such that said voice coil bobbin can be axially vibrated in said air gap,
a dome-shaped diaphragm inserted in and fixed to said voice coil bobbin,
a front chamber surrounded by an inner circumferential surface of said voice coil bobbin and an outer circumferential surface of said diaphragm, and
foamed synthetic resin filled throughout a space in said front chamber.

4,163,877

HOUSING FOR CIRCUITRY AND LOUDSPEAKER OF A MAGNETIC LOCATOR SHIELDS AND RESILIENTLY MOUNTS THE LOUDSPEAKER

Erick O. Schonstedt, Reston, Va., assignor to Schonstedt Instrument Company, Reston, Va.

Filed Jan. 11, 1978, Ser. No. 868,723
Int. Cl.[2] H04R 1/102
U.S. Cl. 179—146 E 9 Claims



1. In magnetic detector apparatus of the type having magnetic sensor means, having circuit means for producing an electrical output from said sensor means, and having a housing for said circuit means, the improvement comprising means supporting a loudspeaker in said housing adjacent to a wall of said housing for producing an audible signal from said electrical output, opening means in said wall for transmitting sound from said loudspeaker to the exterior of said housing, and a shield covering said opening means but providing space for the radiation of sound waves from said loudspeaker, said wall being one end wall of a cover part of said housing that mates with another end wall of said housing having a frame fixed thereto, and said loudspeaker being resiliently supported on said frame by spring means biasing the loudspeaker against the interior of said one end wall.

4. In magnetic detector apparatus of the type having magnetic sensor means, having circuit means for producing an electrical output from said sensor means, and having a housing for said circuit means, the improvement comprising means supporting a loudspeaker in said housing adjacent to a wall of said housing for producing an audible signal from said electrical output, opening means in said wall for transmitting sound from said loudspeaker to the exterior of said housing, and a shield covering said opening means but providing space for the radiation of sound waves from said loudspeaker, said shield comprising a disk with a circumferential lip turned toward said wall, said wall having an external plateau surrounded by and spaced from said lip, the main body of said shield being depressed toward said plateau and the central portion of said shield being fastened to said plateau, said shield and said plateau defining therebetween a space that expands outwardly from the central portion of the shield to an annular opening between said lip and the periphery of the plateau.

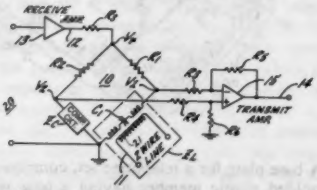
7. In magnetic detector apparatus of the type having magnetic sensor means, having circuit means for producing an electrical output from said sensor means, and having a housing for said circuit means, the improvement comprising a loudspeaker in said housing adjacent to a wall of said housing for producing an audible signal from said electrical output, said loudspeaker being resiliently supported on a frame by spring means biasing the loudspeaker against the interior of said wall, said wall being one end wall of a cover part of said housing that mates with another end wall of said housing to which said frame is fixed, and means for transmitting sound from said loudspeaker to the exterior of said housing.

4,163,878

ELECTRONIC HYBRID AND HYBRID REPEATER WITH BRIDGE CIRCUIT

Mike A. Hashemi, Bolingbrook, Ill., assignor to Wescom, Inc., Downers Grove, Ill.

Filed Sep. 7, 1977, Ser. No. 831,157
Int. Cl.[2] H04B 1/58
U.S. Cl. 179—170 NC 22 Claims



1. A hybrid bridge circuit comprising:
a two-wire port circuit and a compensating network in one pair of adjacent legs of the bridge on opposite sides of an a-c. ground, said compensating network having a frequency dependent impedance which approximates the impedance characteristic presented by the two-wire line to the bridge,

balancing resistors R1 and R2 in the other pair of adjacent legs,

a receive amplifier and an auxiliary resistor Rs connected in series with the output of the receive amplifier between the amplifier and the node between the resistors R1 and R2 for presenting an impedance to both positive-going and negative-going signals from the two-wire line so that all signals from the two-wire line are transmitted to both the node V1 between said two-wire line and the adjacent resistor R1 and the node V2 between said compensating network and the adjacent resistor R2, with signals from the receive amplifier being transmitted to the two-wire line through said auxiliary resistor Rs and the resistor R1 in the bridge, and

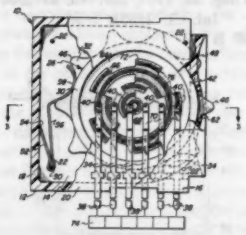
a differential transmit amplifier differentially receiving inputs from said nodes V1 and V2 so that the differential amplifier produces a partially equalized output signal corresponding to the differences between the voltages at said nodes V1 and V2.

4,163,879

SELECTOR SWITCH

Robert W. Mayer, Hackettstown, and Adam Smorzaniuk, West Millington, both of N.J., assignors to Amerace Corporation, New York, N.Y.

Filed Dec. 1, 1977, Ser. No. 856,728
Int. Cl.[2] H01H *19/58*
U.S. Cl. 200—11 TW **19 Claims**



1. A selector switch for selecting any one of a plurality of interconnections among external circuits to be connected to the switch, the interconnections being made in accordance with a predetermined code, said selector switch comprising:

a frame;

a selector mounted for movement relative to the frame to any one of a plurality of fixed relative positions;

the selector including a first part of dielectric material and a second part of non-metallic electrically conductive material, the selector having a contact face and the second part including a pattern extending along the contact face of the selector, the pattern being configured in accordance with the predetermined code; and

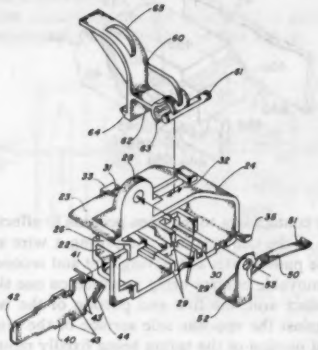
a plurality of electrical contacts affixed to the frame, the contacts having circuit connection portions for connection to the external circuits, and contact surfaces juxtaposed with the contact face of the selector such that movement of the selector relative to the frame to one of said fixed positions will electrically connect and disconnect the contacts in accordance with the pattern of the conductive material at the contact face of the selector to close and open the interconnections among the external circuits.

4,163,880

WEB-SENSITIVE SWITCH ASSEMBLY

Robert L. Stephenson, Sterling Heights; William R. Fox, Warren, and James A. Gavagan, Center Line, all of Mich., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Dec. 7, 1977, Ser. No. 858,132
Int. Cl.[2] H01H *3/16*; A62B *35/00*
U.S. Cl. 200—61.58 B **9 Claims**



1. A switch assembly for use in sensing a seat belt spool condition in a seat belt retractor assembly comprising:

a. a switch housing;

b. a conductive member mounted in said housing, one end of said conductive member forming a fixed contact and the opposite end forming a male terminal for electrical connection;

c. aperture means provided in said housing permitting access to said opposite end of said conductive member;

d. a movable contact element, said movable contact element being supported for selective wiping contact with said one end of said conductive member;

e. actuating means, said actuating means having access to said movable contact element through said housing, said actuating means moving said movable contact element into wiping contact with said one end of said conductive member in response to a predetermined amount of seat belt webbing being stored on the spool of said seat belt retractor, said actuating means permitting said movable contact element to move out of wiping contact with said one end of said conductive member in response to a predetermined amount of seat belt webbing being removed from said seat belt retractor said actuating means comprising a lever arm, said lever arm being pivotally connected to said housing and in contact with the outer surface of a roll of seat belt webbing rolled on the spool of a seat belt retractor assembly; and

f. means for mounting said switch housing on said seat belt retractor assembly.

4,163,881

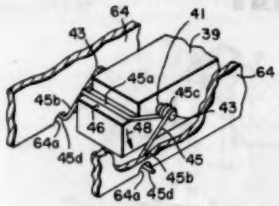
CIRCUIT BREAKER WITH THRUST TRANSMITTING SPRING

Russell T. Borona, Bridgeport, and Kenneth R. Coley, Fairfield, both of Conn., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 29, 1977, Ser. No. 837,656
Int. Cl.[2] H01H *3/00*
U.S. Cl. 200—153 G **2 Claims**

1. In a circuit breaker having a stationary contact, a movable contact, a contact arm carrying said movable contact, a trip structure, a toggle comprising a first link pivotally connected to said contact arm and a second link pivotally connected to said trip structure, a knee pivot pivotally connecting said first

and second links, a manually operable operating member, a thrust-transmitting link between the said operating member and said knee pivot, said operating member being manually movable to a closed position to operate through said thrust-transmitting link to cause said toggle to thrust said contact arm to the closed position, the improvement wherein the contact arm is pivotally mounted on a pinhole axis, bias means for



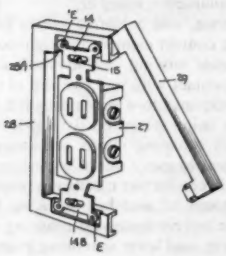
biasing the contact arm to the open position to effect increased separation of the contacts and comprising a wire spring pivoted on the pinhole axis and having first and second end portions, the movable contact being mounted on one side surface of the contact arm, the first end portion of the wire spring bearing against the opposite side surface of the arm, and the second end portion of the spring being fixedly mounted.

4,163,882

ADAPTER FOR STANDARD ELECTRICAL WALL FIXTURES

Floyd M. Baslow, 100 Lafayette St., New Bethlehem, Pa. 16242

Filed Dec. 5, 1977, Ser. No. 857,599
Int. Cl.[2] H01H 9/02; H02G 3/08
U.S. Cl. 200—296 **3 Claims**



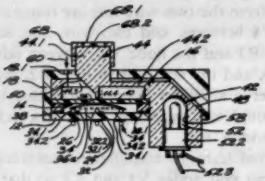
1. An adapter for a standard electrical wall fixture constituted by a light switch or power outlet normally nested within a power line outlet box embedded in the wall, the adapter serving to protrude the fixture outside of the outlet box to displace the face of the fixture relative to the wall, said fixture including a pair of mounting wings on either end of the face, each wing having a slot therein for attaching the wing to the outlet box by a primary screw going through the slot, the length of the screw being sufficient to effect attachment at the displaced position, said adapter comprising spacer means restable against the wall in the area surrounding the box, said spacer means being interposed between said wings and said wall whereby when the primary screws are tightened, the fixture is secured to the box at the displaced position, said spacer means being constituted by a partible rectangular frame which surrounds the box, the wings resting against the ends of the frame, said partible frame being formed of a complementary pair of half-sections which are interconnectable.

4,163,883

KEYBOARD WITH ILLUMINATED KEYS

Henry J. Boulanger, Cumberland, R.I., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 30, 1977, Ser. No. 866,105
Int. Cl.[2] H01H 9/18
U.S. Cl. 200—314 **7 Claims**



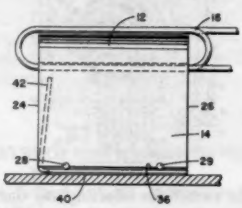
1. In a keyboard system having control means mounted on a base and a member overlying the control means, said member having a frame mounted the member relative to the base and having a key with a button portion integrally joined to the frame by a self-hinge portion of the key movable for selectively actuating the control means, the improvement in which the key member is formed of a light-transmitting material, and light source means direct light into the material of the frame to be conducted at least partly by internal reflection within the member material into the button portion of the key for illuminating the button portion of the key.

4,163,884

INDUCTION HEATING CORE FOR ADHESIVE FASTENING SYSTEMS

Robert G. Kobetsky, Chicago, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Sep. 28, 1977, Ser. No. 837,064
Int. Cl.[2] H05B 5/08
U.S. Cl. 219—10.49 R **7 Claims**



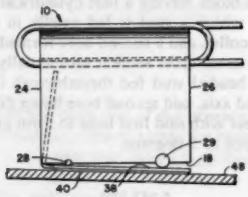
1. An adhesive fastening system comprising, in combination, a pressure applicating U-shaped core means having inductor windings wrapped around a region thereof, a discrete, ferromagnetic article having a plate-like portion with an upper and lower surface carrying a layer of heat activable adhesive on said bottom surface adapted to be adhesively secured to a support surface, the discrete article completing a magnetic circuit between the legs of the U-shaped core, the end faces of the legs of the core and laterally spaced predetermined side marginal regions of said upper surface of the article configured to form pairs of opposing substantially flat surfaces creating the juncture regions between the core and article facilitating the formation of a closed magnetic flux path, rod-like members of rigid, electrically insulating, force transmitting material, embedded in each of the end faces of the core transversing the end faces in a direction from an inner leg surface to an outer leg surface, at least two spaced rod-like members being embedded in one end face to stabilize the core when compressingly associated with the article, the rod-like members serving to maintain said opposing surfaces in carefully controlled, slightly spaced relationship to each other and prevent heat generated in

the discrete article from being conducted back into the core while therefore permitting the magnetic flux generated in said article to generate heat sufficient to activate the adhesive for securement to the support surface.

4,163,885
INDUCTION HEATING CORE AND HEATING SYSTEM FOR ADHESIVE FASTENERS

Robert G. Kobetsky, Chicago, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Sep. 28, 1977, Ser. No. 837,350
Int. Cl.² H05B 5/08
U.S. Cl. 219—10.49 R **4 Claims**



1. An induction heating system comprising in combination, an irregular shaped, discrete metal article, a support surface upon which said article is to be accurately secured, a pressure applicating core structure for use in efficiently heating, by induction, said irregular shaped discrete metal article, said article including a primary attachment section carrying a layer of activable adhesive there beneath and a second nonadhesive carrying secondary attachment section extending generally upwardly from adjacent a perimeter region of said first section the core structure comprising a U-shaped core with end surfaces at the extremities of each leg adapted to be associated with laterally spaced side marginal upper surface regions of said adhesive carrying section so that the adhesive carrying section completes a closed magnetic flux circuit beneath the core, the legs defining front and rear surfaces in planes generally parallel to the plane of the bight portion of the U-shaped core, the flat end surfaces of each leg being coplanar and intersecting the planes of the front and rear leg surfaces, said end surfaces of the core carrying nonconductive means to abut said spaced surface regions of the metal article and nonconductively position the end surfaces in spaced juxtaposed relationship to the associated spaced surface regions with the extremity of said end surfaces located adjacent the nonadhesive carrying section being spaced from the metal article a distance less than the distance of spacing between the other extremity of the end surfaces from its associated upper surface regions on the adhesive carrying section, to tilt the flat end surfaces of the legs out of coplanar relationship with the upper surface regions of the adhesive carrying section of the metal article, the spacing means thereby compensating for the heat dissipated into the nonadhesive carrying section so that the adhesive layer will be uniformly heated between the discrete metal article and support surface.

4,163,886
CONTROL APPARATUS FOR AN AUTOMATIC PIPE WELDER

Tsutomu Omae, and Keizirо Sakai, both of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

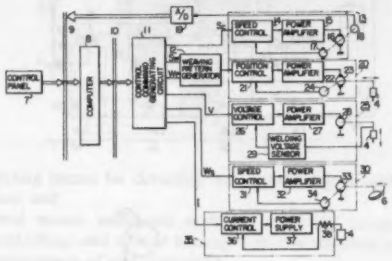
Filed Sep. 15, 1977, Ser. No. 833,561
Claims priority, application Japan, Sep. 16, 1976, 51-109926; Nov. 19, 1976, 51-138429
Int. Cl.² B23K 9/12
U.S. Cl. 219—60 A **8 Claims**

1. A control apparatus for controlling an automatic pipe welder which effects continuous welding along a welding line on a periphery of a pipe, in accordance with predetermined welding conditions previously set to each of a plurality of welding areas sectioned along said welding line, said control apparatus comprising:

a plurality of control units provided respectively for said welding conditions and receiving respective control commands representative of the welding conditions to control the operation of said welder in accordance with the received control commands;

a first digital storage device for storing the welding conditions relating to one of said welding areas at which said welder is present;

a position sensing device for producing a position signal corresponding to the position of said welder;



a second digital storage device for storing all of the welding conditions for said welding areas and for changing the welding conditions stored in said first digital storage device when the second digital storage device receives the position signal indicative of the position of the welder at which the welding conditions are to be changed;

at least one digital-analog converter for converting digital signals produced from said first digital storage device indicative of said welding conditions stored in said first digital storage device, into analog signals; and

a plurality of sample and hold circuits provided respectively for said welding conditions for holding respective analog signals for a predetermined time period and delivering said analog signals as said contol commands.

4,163,887
PULSE GENERATOR FOR ELECTROEROSIVE PROCESSING

Ernst Bühler, Tenero, and Costantino Tadini, Locarno, both of Switzerland, assignors to A.G. für industrielle Elektronik AGIE Losone b. Locarno, Losone, Switzerland

Filed Aug. 16, 1977, Ser. No. 825,036
Claims priority, application Switzerland, Mar. 18, 1977, 3435/77
Int. Cl.² B23P 1/08
U.S. Cl. 219—69 P **9 Claims**

1. A pulse generator for electroerosive processing by means of electrical discharges between a tool electrode and a workpiece electrode, consisting of a main voltage source connected with two output terminals of the generator between the tool electrode and the workpiece electrode through a switching circuit which is activated by an adjustable oscillator, the improved switching circuit therein comprising:

an auxiliary voltage source,

at least two identical impulse amplification stages, each comprising:

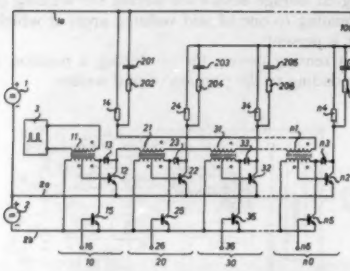
an impulse transformer having a primary winding and also having first and second secondary windings,

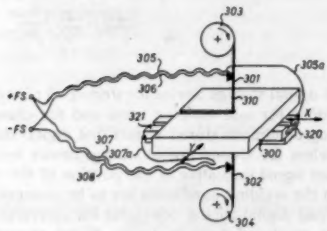
said first secondary winding being connected between the first side of said auxiliary voltage source and a base of a power transistor, and said second secondary winding being connected between said base and through a diode to a collector of said power transistor,

an emitter of said power transistor being connected to the other side of said auxiliary voltage source and also to

one side of said main voltage source, the other side of said main voltage source being connected to one of said output terminals.

said primary winding of said transformer being for the first of said stages connected to said oscillator, and said primary winding for all additional said stages being connected in series between said collector of said power transistor of said first stage and through a current-limiting resistor to said other side of said main voltage source, the collector of said power transistor of all additional said stages being connected through current-limiting resistors to the other of said output terminals.



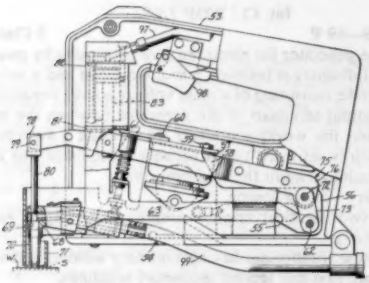


4,163,888

STUD WELDING TOOL

Donald H. Ettinger, Royal Oak, Mich., assignor to USM Corporation, Farmington, Conn.

Filed Oct. 4, 1977, Ser. No. 839,397
Int. Cl.[2] B23K *9/20*
U.S. Cl. 219—98 **14 Claims**



1. An arc welding device comprising a main body having a work engaging end, means connecting the device to a power source for providing a stud welding arc, means for gripping a stud disposed at said work engaging end of said device, said stud gripping means being attached to a lever arm having its longitudinal axis in non-alignment with a stud axis when disposed in said stud gripping means, means for feeding studs seriatim to said stud gripping means including a rod mounted for reciprocating movement from a first position remote from said stud gripping means to a second position within said stud gripping means, means mounted on said lever arm for moving said rod between said first and second positions, means for moving said lever arm in a direction transverse to its longitudinal axis to retract stud gripping means relative to a work surface to cause arcing between a stud retained therein and a work surface, and means to thereafter thrust said stud gripping means toward the work surface to fix a stud retained therein onto the surface.

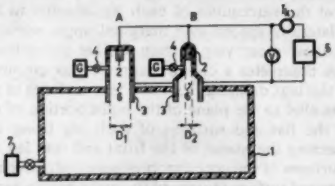
13. In a device for arc welding headed studs to a work surface wherein the studs are fed seriatum to a stud retaining collet, a receiver block having a first cylindrical bore formed therein through which a stud is fed axially in a downward direction to said collet, and a second bore formed in said block and having an internal cross section substantially T-shaped to accommodate a headed stud fed therethrough in a direction normal to the stud axis, said second bore being directed downwardly to intersect with said first bore to form an angle in the range of 0.5 degree to 5 degrees.

4,163,889

DEVICE FOR THE SIMULTANEOUS OPERATION OF A NUMBER OF GAS DISCHARGE ELECTRON GUNS

Theodorus M. B. Schoenmakers, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 575,723, May 8, 1975, abandoned. This application Dec. 17, 1976, Ser. No. 751,488
Claims priority, application Netherlands, May 27, 1974, 7407058
Int. Cl.[2] B23K *15/00*
U.S. Cl. 219—121 EB **6 Claims**



1. A low pressure high voltage glow discharge device for simultaneously generating at least two beams of charged particles having different current intensities, comprising an envelope, a plurality of electron gun assemblies each including an anode and a cathode arranged at a distance from one another, the anodes and cathodes defining separate discharge spaces which communicate with said envelope, said discharge spaces having different volumes, means for maintaining substantially equal pressures in said discharge spaces and means for applying the same voltage to at least two of said electron gun assemblies, said two electron gun assemblies having substantially the same electrode geometry.

4,163,890

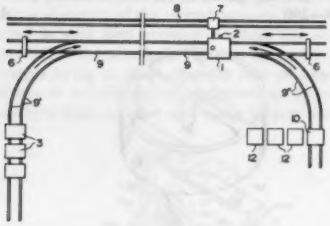
METHOD AND APPARATUS FOR ELECTRON BEAM WELDING

Kiyohide Terai, Ashiya, and Hiroyoshi Nagai, Kobe, both of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Filed Sep. 23, 1977, Ser. No. 835,860
Claims priority, application Japan, Sep. 24, 1976, 51-114850; Mar. 18, 1977, 52-29293
Int. Cl.[2] B23K *9/00*
U.S. Cl. 219—121 EB **3 Claims**

1. Means for electron beam welding which includes vacuum chamber means comprising a primary chamber unit having at

least one open end and provided with adaptor means for accommodating electron beam welding gun means and second adaptor means for accommodating evacuating means, at least one auxiliary chamber unit having opposite open ends, one of said open ends of the auxiliary chamber unit being adapted to



be connected to the open end of the primary chamber unit to form a single chamber, closure means for closing the other end of the auxiliary chamber unit, means for lifting and turning the chamber unit, and means for introducing a workpiece into the thus turned chamber unit.

4,163,891

ACTIVE GAS PLASMA ARC TORCH AND A METHOD OF OPERATING THE SAME

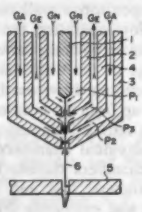
Akio Komatsu, and Masaharu Inaba, both of Tokyo, Japan, assignors to Origin Electric Co., Ltd., Tokyo, Japan

Filed May 16, 1978, Ser. No. 906,652

Claims priority, application Japan, May 20, 1977, 52/58508

Int. Cl.[2] B23K *5/00*

U.S. Cl. 219—121 P **2 Claims**



1. An an active gas plasma arc torch including a rod-shaped cathode, a first gas passage formed around said cathode to feed a shielding gas, a second gas passage formed around said first gas passage to feed a plasma gas and a constricted port for discharging the plasma gas, said cathode and first and second gas passages being arranged in concentric relation with each other, said torch comprising a gas discharge passage formed between said first gas passage and said second gas passage whereby the shielding gas flowing out from said first gas passage is discharged through said gas discharge passage to the outside of the torch.

4,163,892

FIXING APPARATUS

Toshiyuki Komatsu, Kawasaki; Yoshio Takasu; Motoharu Fujii, both of Tokyo, and Susumu Sugiura, Yamato, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 8, 1976, Ser. No. 748,479

Claims priority, application Japan, Dec. 15, 1975, 50-150023; Feb. 25, 1976, 51-19610; Jun. 3, 1976, 51-64916; Jun. 24, 1976, 51-74661

Int. Cl.[2] H05B *1/00*; G03G *15/20*

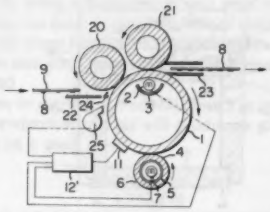
U.S. Cl. 219—216 **16 Claims**

1. A fixing apparatus comprising:

first heating means, having a heatable surface which is contactable with a toner image bearing member, for heating a toner image on said toner image bearing member;

urging means for press-contacting the toner image bearing member to said surface;

second heating means for applying radiant heat to the toner image on the toner image bearing member at least at an area where it is press contacted with said first heating means;



detecting means for detecting the temperature of said surface; and

control means, associated with said detecting means, for controlling said second heating means in response to the temperature of said surface;

wherein said surface of said first heating means is a surface of a rotatable cylinder formed of a material capable of passing said radiation heat therethrough, and said second heating means is disposed within said cylinder.

4,163,893

TONER FIXING ARRANGEMENT IN ELECTROSTATIC PRINTERS AND COPIERS

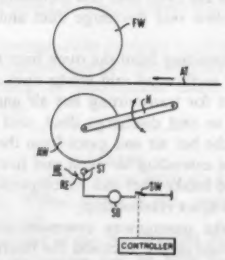
Gerhard Turini, Maisach, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Oct. 25, 1977, Ser. No. 845,395

Claims priority, application Fed. Rep. of Germany, Feb. 11, 1977, 2705893

Int. Cl.[2] H05B *1/00*; G03G *15/20*

U.S. Cl. 219—216 **9 Claims**



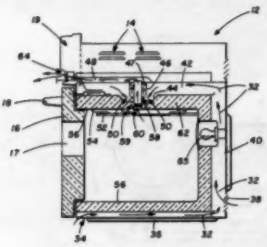
1. In a fixing device for fixing a toner image applied to a data carrier in electrostatic copying device wherein the fixing device includes a heated fixing cylinder and an opposed pressure cylinder biasing the data carrier into contact with the fixing cylinder to fuse a toner image on the data carrier by application of heat, the improvement of a preheating device positioned adjacent a rest position of the pressure cylinder, activating control means for the preheating device effective to preheat the pressure cylinder upon start up of the copier device, the preheat device being deactivated during a toner fusing operation.

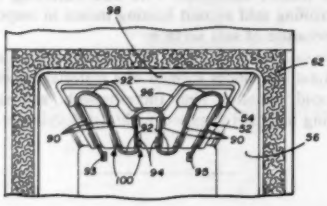
4,163,894

OVEN HAVING A DILUTING VENTILATION SYSTEM

Richard M. Scherer, Oxford, Miss., assignor to Chambers Corporation, Oxford, Miss.

Filed Dec. 8, 1977, Ser. No. 858,641
Int. Cl.[2] F24C *15/32, 15/20*
U.S. Cl. 219—391 15 Claims





1. In an oven including a housing and an oven liner, a ventilation system comprising:

a discharge duct defining an enclosed volume within the oven housing and including at least one discharge passageway communicating with the exterior of the oven for discharging air and gases from said discharge duct;

an intake duct disposed below said discharge duct and including at least one intake passageway communicating with the exterior of the oven for receiving air into said intake duct, said intake duct including a first surface disposed above the oven liner and including a second surface disposed below said discharge duct and above said first surface;

a vent tube extending from the oven liner through said first and second surfaces of said intake duct and into said discharge duct for transmitting hot air and gases from the oven liner to said discharge duct, said vent tube being heated by the hot air and gases from the oven liner;

A diluter tube extending between said first and second surfaces of said intake duct and encompassing said vent tube in a spaced apart relationship;

a diluter intake passageway communicating between the interior of said intake duct and the interior of said diluter tube for receiving air into said diluter tube; and

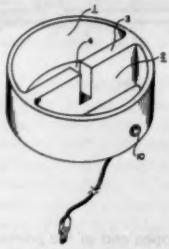
a diluter discharge passageway communicating between the interior of said diluter tube and the interior of said discharge duct for discharging air from the diluter tube into the discharge duct, whereby air from the exterior of the oven is transmitted through said intake duct, through said diluter intake passageway, through said diluter tube while being heated by said vent tube, through said diluter discharge passageway and into said discharge duct for being mixed with hot air and gases from said vent tube and discharged from the oven through said discharge passageway.

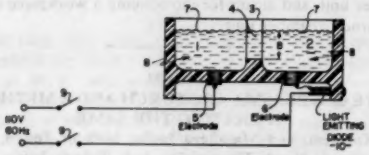
4,163,895

ELECTROLYTIC WATER HEATER

Stephen G. Hauser, 6267 Variel Ave., Woodland Hills, Calif. 91364, and John G. Bowen, 11521 Heathcliff Dr., Santa Ana, Calif. 92705

Filed Jun. 25, 1975, Ser. No. 590,050
Int. Cl.[2] H05B *3/60;* H01C *10/02*
U.S. Cl. 219—290 4 Claims





1. An electrolytic heater for an electrically conductive solution comprising: a housing formed of electrically insulating material having an open top and a closed bottom for receiving the solution through its open top; a wall extending across the interior of the housing for separating the interior into two chambers, said wall having an opening therein in the form of a channel in the upper edge of the wall intermediate the ends thereof, said channel extending downwardly from the upper edge to a plane displaced up from the bottom of the two chambers, said opening having reduced dimensions with respect to the dimensions of the individual chambers for receiving the solution from the two chambers thereto to intercouple the solution in the two chambers; first and second electrodes mounted in said housing and extending through said bottom thereof into respective ones of said two chambers in position to establish respective electric contact with the solution in the two chambers; and means for connecting the electrodes to a source of electrical power.

4,163,896

WET DRESSING HEATING SYSTEM

James D. McAvinn, Chicago, and Harish A. Patel, Crystal Lake, both of Ill., assignors to The Kendall Company, Boston, Mass.

Filed Jun. 29, 1977, Ser. No. 811,026
Int. Cl.[2] H05B *3/58*
U.S. Cl. 219—525 15 Claims

1. A heating system for dressings, comprising:

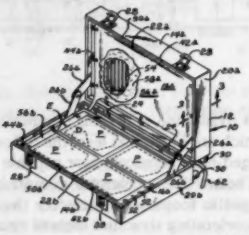
a housing having a pair of first and second closure shells, each of said shells having a back wall and sidewalls extending around the periphery of the associated back wall, with said back wall and sidewalls defining a cavity in each of said shells;

hinge means connecting a sidewall of said first and second shells and permitting movement of said shells between a first open position of the housing and a second closed position of the housing with the sidewalls of said shells mating and with said shells defining a closed chamber;

first and second elongated heating elements;

means for supporting said heating elements in the housing with said first heating element being located adjacent

outer edges of the sidewalls in said first shell and substantially closing the cavity in the first shell, and with said second heating element being located adjacent outer edges of the sidewalls in said second shell and substantially closing the cavity in the second shell, said heating elements being closely facing each other in said second housing position to define a heating space intermediate the heating elements of the closed housing, and being widely spaced in said first housing position for receipt of the dressings intermediate the heating elements, said heating elements being at least partially free of attachment and defining an access opening adjacent an outer end of the respective shell relative said hinge means; and



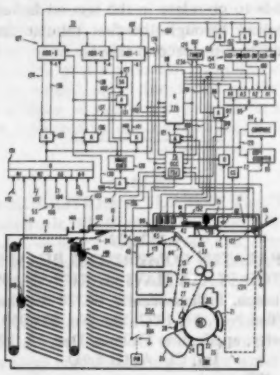
first and second insulation members in the housing, said first insulation member being located intermediate the first heating element and the back wall of said first shell and defining a narrow storage space intermediate the first heating element and first insulation member for placement of heated dressings through the associated access opening into the storage space, and said second insulation member being located intermediate the second heating element and the back wall of said second shell and defining a narrow storage space intermediate the second heating element and second insulation member for placement of heated dressings through the associated access opening into the respective storage space.

4,163,897

AUTOMATIC COPY RECOVERY

James H. Hubbard, Boulder, and Wallace L. Hubert, Broomfield, both of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 19, 1977, Ser. No. 843,384
Int. Cl.[2] G06B 27/06
U.S. Cl. 235—92 SB **23 Claims**



1. The method of operating a copy production machine for identifying images copied onto copy sheets said machine having a copy production portion, an output portion, and copy sheet path means extending through said copy production portion to said output portion, a plurality of image bearing copy sheets being simultaneously transportable serially through said path means, said sheets carrying diverse images, comprising the steps of:

establishing a plurality of separate counts of copy sheets respectively for each of said images on said copy sheets currently being transported in said path means,

subtracting one from a respective one of said separate counts as a given sheet bearing an image reaches a predetermined point in said path means with respect to said output portion, and

adding one to a given one of said counts to indicate that said copy production portion will produce a given one of said images on a copy sheet.

4,163,898

METHOD OF FORMING RADIOGRAPHIC IMAGES

Tetsuo Ishii, Ebina, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Nov. 10, 1977, Ser. No. 850,318
Int. Cl.[2] G03G 13/00
U.S. Cl. 250—315 R **2 Claims**

1. A method of forming a radiographic image comprising the steps of

irradiating X-rays through a subject, which is to be inspected, to an exoelectron emitting member composed of a conductive substrate and an exoelectron emitting substance thereon;

subsequently, coating the surface of the exoelectron emitting member with a charge injection liquid;

then placing a insulating sheet in intimate contact with the charge injection liquid;

further coating an electroconductive liquid over said insulating sheet and laying an electroconductive electrode thereover; and

then effecting heating while applying a voltage between said conductive substrate and said electroconductive electrode thereby forming an electrostatic latent image on said insulating sheet.

4,163,899

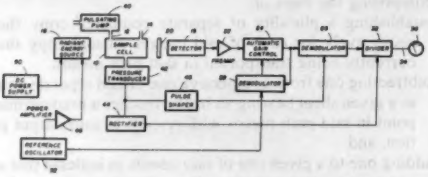
METHOD AND APPARATUS FOR GAS ANALYSIS

Irvin G. Burough, Walnut Creek, Calif., assignor to Andros, Inc., Berkeley, Calif.

Continuation-in-part of Ser. No. 855,895, Nov. 30, 1977, abandoned. This application Jun. 19, 1978, Ser. No. 916,609
Int. Cl.[2] G01J 1/00
U.S. Cl. 250—343 **9 Claims**

1. A method for detecting the concentration of a selected gas in an unknown gas sample, comprising, directing from a radiant energy source radiant energy having a wave length spectrum including a characteristic absorption wave length of the selected gas through a sample volume of the unknown gas, modulating the power output of the radiant energy source at a first frequency, simultaneously modulating absorption of the radiant energy within the sample volume by varying gas density therein at a second frequency, detecting the radiant energy passing through the sample volume and producing a composite

signal corresponding to said detected radiant energy having first and second components at said first and second frequencies, respectively, producing a reference signal proportional to the amplitude of gas density variation at said second frequency, and processing said composite signal and said reference signal



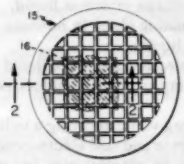
to produce an output signal proportional to the amplitude of the second signal component divided by the product of the amplitude of the first signal and the reference signal, said output signal being proportional to the concentration of the selected gas in the sample.

4,163,900

COMPOSITE ELECTRON MICROSCOPE GRID SUITABLE FOR ENERGY DISPERSIVE X-RAY ANALYSIS, PROCESS FOR PRODUCING THE SAME AND OTHER MICRO-COMPONENTS

John B. Warren, Westport, and Michael R. Kundrath, Fairfield, both of Conn., assignors to Connecticut Research Institute, Inc., Fairfield, Conn.

Filed Aug. 17, 1977, Ser. No. 825,243
Int. Cl.[2] G01N *23/00*
U.S. Cl. 250—439 R **19 Claims**



1. A specimen support, for use with an electron microscope having an energy dispersive X-ray device for receiving spectral X-rays produced from the electron bombardment of the specimen and the specimens support, said support

(A) being responsive to electron bombardment to produce spectral X-ray peaks ranging between the X-ray energy of hydrogen and the X-ray energy of oxygen;

(B) being electrically conductive; and

(C) comprising a composition essentially of a homogeneous blend of

(a) between about 10% and 90% by weight of a hydrocarbon polymer, and

(b) between about 10% and 90% by weight of elemental carbon,

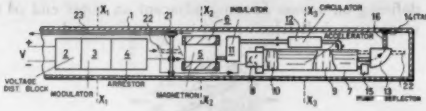
whereby the X-ray energy of the specimen support produced by the electron bombardment never exceeds the X-ray energy of oxygen, thereby providing a specimen support that substantially eliminates spectral X-ray peaks which could interfere with the X-ray peaks of the specimen.

4,163,901

COMPACT IRRADIATION APPARATUS USING A LINEAR CHARGED-PARTICLE ACCELERATOR

Guy Azam; André Bensussan; Jean-Baptiste Gallet, and Duc Tien Tran, all of Buc, France, assignors to CGR-MeV, Buc, France

Filed Apr. 5, 1978, Ser. No. 893,780
Claims priority, application France, Apr. 6, 1977, 77 10394
Int. Cl.[2] H05G *1/26*; G21G *4/00*
U.S. Cl. 250—401 **14 Claims**



1. A compact irradiation apparatus comprising a fluid-tight enclosure in which are located at least the following elements:

a linear charged-particle accelerator capable of emitting an irradiation beam, this accelerator comprising an electron gun, a magnetic focussing system for the beam of electrons, an accelerating structure formed by an accelerating section and a complementary section with resonant cavities;

a high frequency generator supplying a high frequency signal;

means for injecting this high frequency signal into said accelerating structure;

means for supplying high voltage to the high frequency generator and to the accelerator;

means enabling a predetermined vacuum to be maintained in the accelerator during its operation;

a cooling system for cooling at least some of the elements is included in the enclosure, this cooling system enabling the heat generated by these elements to be dissipated into the wall of said enclosure, said high frequency generator being a magnetron associated with permanent magnets, the magnetron and its permanent magnets being cooled by an auxiliary cooling circuit disposed along their walls, this cooling circuit comprising a first tubular ring and a second tubular ring arranged on either side of the pole pieces of the magnetron and in contact therewith, these two rings being connected by a first helical tube placed against the inner walls of the permanent magnets, in that a second helical tube is placed against the outer wall of said magnetron, the two helical tubes being connected to one another by the second tubular ring in such a way that a cooling fluid is able to circulate in the second helical tube after having passed through the first tubular ring, the first helical tube and the second tubular ring.

4,163,902

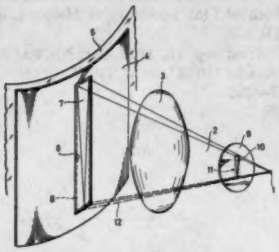
X-RAY APPARATUS COMPRISING BEAM SHAPING RESTRICTOR PLATE HAVING KEY-SHAPED GAP

Freddy W. Musaph, Tellazamiientie, 04320 Riihikallio, Finland

Filed Nov. 14, 1977, Ser. No. 851,059
Claims priority, application Finland, Dec. 17, 1976, 763628
Int. Cl.[2] A61B *6/00*
U.S. Cl. 250—482 **4 Claims**

1. Apparatus for an X-ray device adapted for use with an X-ray tube, a radiation-sensitive film, and an object to be radiated disposed intermediate the tube and the film comprising a

restrictor plate of radiation-opaque material comprising a key-shaped gap configured and dimensioned to shape a beam of



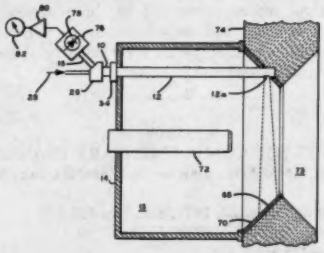
radiation passing therethrough from the tube to the object to obtain an advantageous darkness distribution on the film.

4,163,903

FLAME MONITORING APPARATUS

Donald Robertson, Ambler, Pa., assignor to Leeds & Northrup Company, North Wales, Pa.

Filed Oct. 27, 1977, Ser. No. 845,985
Int. Cl.[2] G08B *21/00*
U.S. Cl. 250—554 **5 Claims**



1. Flame monitoring apparatus capable of signalling the loss of flame from a single burner of a multiple burner installation in which each burner is individually mounted in a recess in a boiler wall comprising:

radiation collecting means mounted for collecting radiation from a limited optical path extending across the opening of said recess and terminating on a wall of said recess to collect radiation from the flame of an individual burner in said path when said flame is present and for collecting radiation from only a portion of the wall of said recess associated with said burner when said flame is out, and

means connected to said radiation collecting means for producing an output signal indicative of the presence or absence of flame at said burner in response to the level of radiation collected by said radiation collecting means.

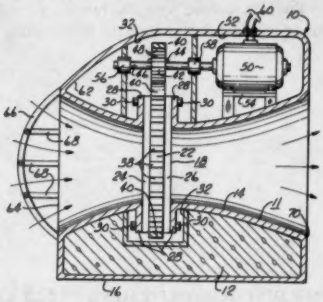
4,163,904

UNDERSTREAM TURBINE PLANT

Lawrence Skendrovic, 402 Glencoe Dr., West Mifflin, Pa. 15122

Continuation-in-part of Ser. No. 663,868, Mar. 4, 1976, abandoned. This application Mar. 6, 1978, Ser. No. 883,382
Int. Cl.[2] F03B *13/10*; F01D *13/00*; F16J *15/34, 15/40*
U.S. Cl. 290—54 **8 Claims**

1. An understream turbine plant for generating electrical power by means of the flow of a large understream effluent comprising a large housing having a large water flow passage therethrough, a single impeller mounted within said passage in a plane transverse thereto and adapted to drive an electrical generator mounted in said housing and sealed from exterior liquid contact, said impeller including a plurality of impeller blades mounted at their inner ends to a hub and radially extending therefrom in said plane and secured at their outer ends to the inner surface of a ring member, said ring member rotatably mounted in bearings and in bearing seal means sealing the interior of said housing from said exterior liquid, drive coupling means engaged with said ring member and said generator to drive said generator by means of understream effluent passing through said opening, means to mount said housing in an ocean understream effluent such as the Gulf Stream with said passage aligned with the flow of said understream, insulated conductor means connected to said generator and passing in a



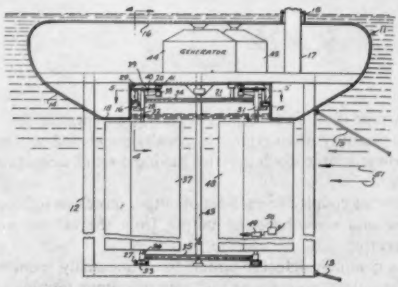
sealed through said housing to conduct electricity from said generator to a location above an ocean surface, said bearing seal means including a smooth annular bearing surface on each side of said ring member, a pair of annular bearing rings respectively annularly engaging said bearing surfaces, support means annularly supporting each of said bearing rings to said housing, and annular resilient seal means annularly disposed under compression between said housing and at least one of said support means to provide a liquid seal therebetween and continuously urging said bearing rings into sealed bearing engagement with said bearing surfaces.

4,163,905

ELECTRIC GENERATING WATER POWER DEVICE

Fred E. Davison, Highwood, Mont. 59450

Continuation of Ser. No. 609,008, Aug. 29, 1975, abandoned. This application May 5, 1978, Ser. No. 905,523
Int. Cl.[2] F01D *23/00*
U.S. Cl. 290—54 **15 Claims**



1. A water power machine comprising a generally horizontally elongated frame submerged in the water, means to anchor the frame in a substantially fixed position, a flotation chamber secured on the top portion of the frame and having an inverted cup-like bottom wall portion, air pump means connected to said cup-like bottom portion to pressurize same and form an air compression chamber, respective parallel top and bottom

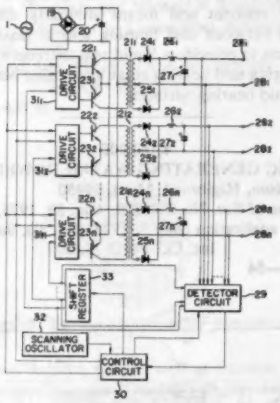
endless rails secured respectively lengthwise in said compression chamber and to the bottom portion of said frame, each of said rails including a pair of relatively long spaced apart runs connected at their opposite ends by relatively short semi-circular runs, a plurality of trucks mounted on the top endless rail at spaced apart intervals for movement therealong, a first flexible endless chain connecting said trucks, electric generator means coupled to said first endless chain, vertical shafts journaled to said trucks and having bottom guide means engaging the bottom endless rail, sleeve means journaled on the lower ends of the shafts, a second endless chain connecting said sleeve means, respective blades mounted on said shafts between the endless chains, and means for rotating said blades around the axes of the shafts to desired positions relative to water currents in accordance with the positions of the blades along the endless rails.

4,163,906

TIME DIVISION SWITCHING REGULATOR

Hironori Shimamura, Yokohama, Japan, assignor to Nippon Electronics Memory Industry Co., Ltd., Tokyo, Japan

Filed Aug. 24, 1977, Ser. No. 827,343
Claims priority, application Japan, Aug. 25, 1976, 51-100505
Int. Cl.² H02P *13/26*
U.S. Cl. 307—39 **12 Claims**



1. A time division switching regulator comprising

(a) a plurality of inverters electrically connected to a single power source, each inverter having a set of output terminals,

(b) means coupled to each set of output terminals for rectifying and smoothing the output from the corresponding inverter,

(c) a common detector circuit for sequentially monitoring the output voltages at said sets of output terminals and comparing said monitored voltages with a predetermined reference voltage to sequentially generate corresponding error signals,

(d) a common control circuit responsive to said error signals for sequentially controlling the outputs of the corresponding inverters, and

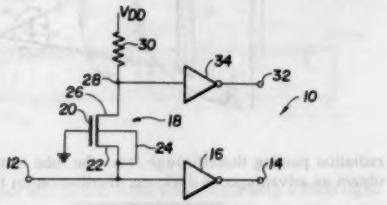
(e) a shift register for sequentially enabling said inverters.

4,163,907

THREE LOGIC STATE INPUT BUFFERS

James E. Schroeder, Indialantic, and Richard L. Goslin, Melbourne, both of Fla., assignors to Harris Corporation, Melbourne, Fla.

Filed Sep. 16, 1977, Ser. No. 833,934
Int. Cl.² H03K *19/20, 19/08, 17/30, 17/60*
U.S. Cl. 307—209 **19 Claims**



1. A three logic state buffer comprising:

input means for receiving positive and negative polarity input signals;

first output means for providing two logic level output signals for one polarity of said input signals;

semiconductor switch means connected to said input means;

impedance means connected between a voltage source and said switch means; and

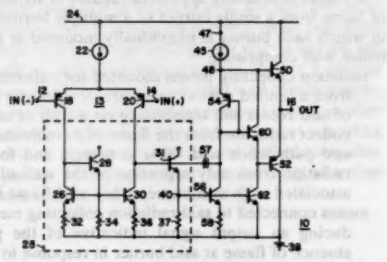
second output means connected to the junction of said switch means and said impedance means for providing two logic level output signals for a polarity of said input signals opposite said one polarity.

4,163,908

BIAS CIRCUIT FOR COMPLEMENTARY TRANSISTORS

John J. Price, Mesa, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 22, 1977, Ser. No. 826,623
Int. Cl.² H03K *1/00, 17/60*
U.S. Cl. 307—296 R **12 Claims**



1. A bias circuit for complementary NPN and PNP transistors, including in combination:

a single current supply means for providing a current of a predetermined magnitude at an output terminal thereof;

first semiconductor bias means having a junction coupled to said current supply means and one of the complementary transistors; second semiconductor bias means having a junction coupled to said current supply means and the other of the complementary transistors, said junctions of said first and second semiconductor bias means being connected in series with each other across the base-to-emitter junctions of the complementary NPN and PNP transistors;

first current sink means coupled in series with said single current supply means and to said first semiconductor bias

means for controlling the amount of bias current conducted by said first semiconductor bias means; and

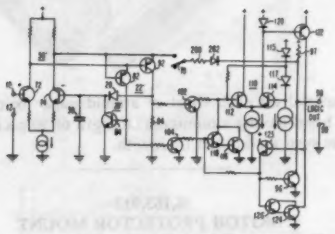
second current sink means coupled in series with said single current supply and said second semiconductor bias means for controlling the amount of bias current conducted by said second semiconductor bias means.

4,163,909

PEAK DETECTING CIRCUITRY AND DUAL THRESHOLD CIRCUITRY THEREFOR

Jerome D. Harr, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 23, 1977, Ser. No. 827,048
Int. Cl.[2] H03K *5/153*
U.S. Cl. 307—351 **20 Claims**



1. Peak detecting circuitry, comprising

a pair of signal input terminals at which an electric wave is applied for determining the occurrence of peak values thereof,

a pair of detector output terminals at which an electric energy level is presented for indicating the occurrence of said peak values,

a differential amplifying circuit having one input terminal connected to one of said pair of signal input terminals, having another input terminal, and having a pair of differential output terminals,

an electric energy storage device connected between said other input terminal of said differential amplifying circuit and said other terminal of said pair of signal input terminals,

one differential amplifier circuit having a pair of input terminals individually connected to both of said differential output terminals of said amplifying circuit and having an output terminal connected to said storage device for charging the same,

another dfferential amplifier circuit having a pair of input terminals individually connected to both of said differential output terminals of said amplifying circuit and having an output terminal connected to said storage device for discharging the same, and

electric level conveying circuit connections between said detector output terminals and said output terminals of said amplifier circuits.

4,163,910

VAPOR GENERATOR AND MHD POWER PLANT

Francis T. Matthews, Poquonock, and Carl R. Bozzuto, Enfield, both of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Jan. 31, 1977, Ser. No. 764,119
Int. Cl.[2] H02N *4/02*
U.S. Cl. 310—11 **4 Claims**

1. A system for generating power from the combustion of fuel and air, including

a magnetohydrodynamic burner,

a source of combustible fuel connected to the burner,

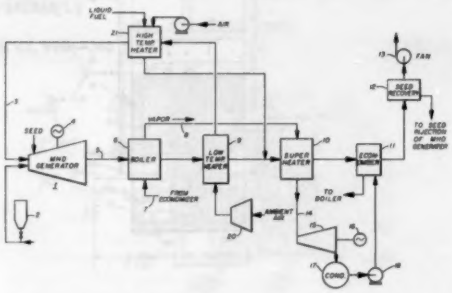
a furnace bottom section connected to the discharge duct of the burner so as to receive the hot MHD discharge gases directed tangentially into the section, whereby slag in the gases is separated from the gases by centrifugal force and collects on the refractory-lined wall to run to the low point of the section and the high forward velocity of the MHD discharge gases is reduced by both expansion and the swirl induced by tangential injection,

a slag quench tank connected to the section at the low point for transfer of excess slag from the section,

a neck discharge at the top of the section and sized and shaped to maintain the swirl in the discharge gases and capture entrained slag particles,

a main furnace section connected to the discharge neck to receive the MHD discharge gases and transfer heat from the gases to liquid in generating vapor as a source of power,

a backpass section connected to the gas discharge of the main furnace section and receiving the MHD discharge gases,



heat exchange tubes mounted in the backpass section and connected to a source of combustion air for the MHD burner for the transfer of heat from the discharge gases to the combustion air,

an air compressor connected to the entrance of the heat exchange tubes mounted in the backpass section as the source of combustion air for the MHD burner,

and a high temperature air heater separately fired by an atmospheric burner connected to the exit of the heat exchange tubes for raising the temperature of the combustion air to the final temperature required by the MHD burner,

and an injection-mixing system mounted in the backpass section and connected to the discharge of the atmospheric burner of the high temperature air heater to mix the burner discharge with the MHD burner gases after the burner discharge has heated the combustion air for the MHD burner.

4,163,911

PERMANENT MAGNET TRANSLATIONAL MOTOR FOR RESPIRATORS

James G. Simes, and Donald H. Gillott, both of Sacramento, Calif., assignors to Sutter Hospitals Medical Research Foundation, Sacramento, Calif.

Continuation of Ser. No. 544,650, Jan. 27, 1975, abandoned, which is a continuation-in-part of Ser. No. 323,501, Jan. 15, 1973, Pat. No. 3,863,082. This application Jan. 19, 1977, Ser. No. 760,556
Int. Cl.[2] H02K *33/18*
U.S. Cl. 310—27 **13 Claims**

1. An air delivery system for a respirator capable of applying at least 36 pounds of force to a respirator piston through a stroke length of at least six inches, the air delivery system comprising

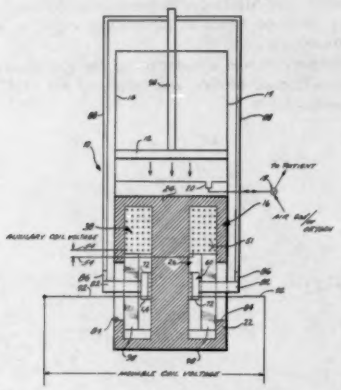
(a) a cylinder and a piston movable in the cylinder for forcing air to a patient through an air outlet in the cylinder,

(b) a translational motor for moving the piston which includes a shell adjacent the cylinder and having an outer

wall with a pair of closed ends forming an enclosed hollow interior of the shell,

(c) an elongated core extending through the hollow interior of the shell between the closed ends thereof,

(d) permanent magnet means in the hollow interior surrounding a predetermined length of the core, the permanent magnet means being spaced from the core to form a narrow working air gap surrounding the core and extending laterally from the outer surface of the core to the permanent magnet means, whereby a magnetic field is established across the narrow working air gap,



(e) a movable drive coil surrounding the portion of the core located in the working air gap, the drive coil being movable along the length of the core in the magnetic field in response to changes in electric current passing through the drive coil, the working air gap being substantially void between the outer surface of the core and the permanent magnet means so as to be as narrow as possible but still accommodate the movable drive coil, and

(f) drive means extending outwardly from the drive coil through corresponding openings in the shell outer wall and connecting the piston to the drive coil to apply reciprocating translational motion to the piston in response to movement of the drive coil.

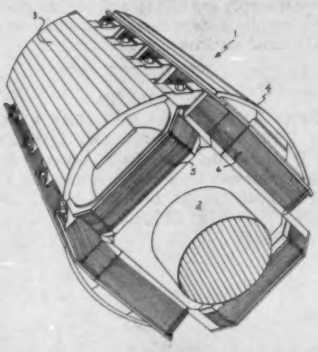
4,163,912

ELECTRICAL INSULATING SHEET MATERIAL AND ELECTRIC WINDING MADE THEREFROM

William H. Gottung, Ballston Lake, and Kevork A. Torossian, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Sep. 23, 1977, Ser. No. 836,095
Int. Cl.[2] H02K *15/12*
U.S. Cl. 310—45 **9 Claims**

1. An insulated dynamoelectric machine winding comprising a plurality of generally flat-sided turns of electrically conductive metal stacked with respective flat sides in facing relationship, a plurality of sheets of electrical insulating material each positioned, respectively, between facing sides of said turns to electrically insulate the turns from each other, each of said sheets of insulating sheet material comprising a sheet of aramid paper, a coating of thermosetting resinous adhesive material in a solid but heat bondable state and substantially uniformly distributed over at least one side of the aramid paper sheet, and a pressure sensitive adhesive material applied in a pattern to at least one side of the resin-coated aramid paper sheet, said pattern being of predetermined configuration to limit to a predetermined maximum distance the spacing between any point on the sheet not covered with pressure sensitive adhesive material and the closest point in the pattern of pressure sensitive adhesive material, said pressure sensitive adhesive material having a predetermined peel strength sufficient to hold the paper to a surface before the thermosetting adhesive is bonded thereto, the thermosetting resinous adhesive material on each sheet of aramid paper being cured to form a bond having a minimum strength of 50 p.s.i. at 155° C. with the turn juxtaposed therewith.

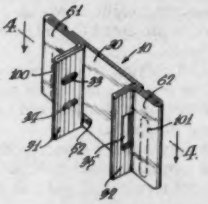


4,163,913

MOTOR PROTECTOR MOUNT

Thomas R. Barratt, Bristol, Tenn., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Dec. 5, 1977, Ser. No. 857,401
Int. Cl.[2] H02K *5/00*
U.S. Cl. 310—91 **12 Claims**



1. A motor protector mount for a motor protector having a body with a central primary section, a thinner end section and a pair of terminal prongs at the opposite end comprising, a base of insulation material, a pair of spaced-apart tabs extending outwardly from said base and spaced apart a distance less than the length of the motor protector, and means defining openings in said tabs with an opening in one tab being of a size to receive said thinner end section but not said central primary section to permit extension of the end section beyond said one tab and a pair of openings in the other tab to permit extension of said terminal prongs therethrough for engagement with lead wire terminals.

4,163,914

INFINITELY VARIABLE RATIO PERMANENT MAGNET TRANSMISSION

John H. Keyes, P.O. Box 474, Nederland, Colo. 80466

Filed Apr. 11, 1977, Ser. No. 786,545
Int. Cl.[2] H02K *7/114*
U.S. Cl. 310—103 **10 Claims**

1. An infinitely variable ratio power transmission and brake assembly, comprising:

power input means;

drive disc means operatively connected to said power input means for rotation about an axis of rotation and for rotation when power is supplied to said power input means;

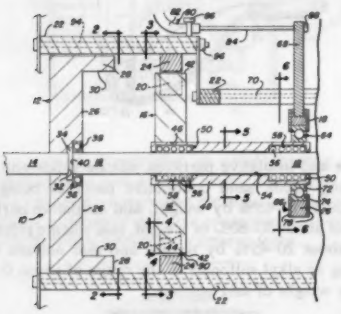
driven disc means operatively connected in spaced apart

and non-contacting relation with said drive disc means for rotation about the axis of rotation;

power output means operatively connected to rotate with said driven disc means when said driven disc means is rotated;

magnetic braking means positioned in spaced apart and non-contacting relation with respect to both said disc means;

permanent magnet means, positioned on at least one of said disc means or said braking means, for producing magnetic flux adapted to be selectively coupled through the space between said drive and driven disc means and



through the space between said driven disc means and said braking means to create a predetermined driving interaction force between said drive and driven disc means and to create a predetermined restraining interaction force between said driven disc means and said braking means, respectively; and

control means, operatively associated with said drive disc means and driven disc means and said braking means, for selectively varying the predetermined quantity of magnetic flux coupled between said drive and driven disc means and for varying the predetermined quantity of magnetic flux coupled between said driven disc means and said braking means.

4,163,915

ELECTRIC MOTORS OR GENERATORS

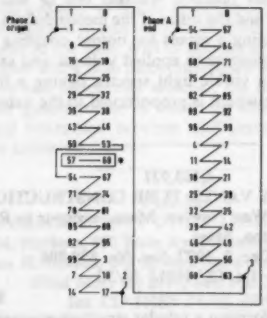
William Fong, Bristol, England, assignor to National Research Development Corporation, London, England

Filed Jul. 21, 1977, Ser. No. 817,924

Claims priority, application United Kingdom, Jul. 26, 1976, 31008/76

Int. Cl.[2] H02K *3/00*

U.S. Cl. 310—198 **9 Claims**



1. A 3-phase alternating-current, single-pole-number, electric machine having three double-layer wave-sound stator phase-windings, each said phase-winding comprising an even number of similar but not identical phase-winding parts, the odd-numbered ones of said phase-winding parts differing from the even-numbered ones thereof by the presence of a dummy coil in said odd-numbered ones of said phase-winding parts, said phase-winding parts being connected together alternatively for alternative voltage operation, one alternative connection comprising parallel connection of all the phase-winding parts for each phase-winding.

4,163,916

MOTOR BRUSH

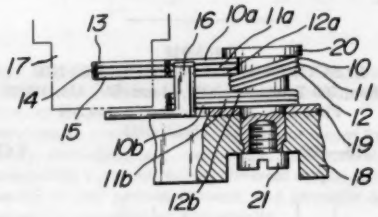
Minoru Kobayashi, Hachioji, Japan, assignor to Olympus Optical Company Ltd., Tokyo, Japan

Filed Oct. 20, 1977, Ser. No. 844,128

Claims priority, application Japan, Oct. 22, 1976, 51/142168[U]

Int. Cl.[2] H02K *13/00*

U.S. Cl. 310—246 **3 Claims**



1. A brush assembly for an electric motor including a commutator and a motor case comprising: a spring assembly formed of a plurality of individual spring wire members wound together in a helical configuration and having first and second ends extending together tangentially outwardly of said helical configuration, said spring wire members being mounted together in generally parallel extending relationship to form said spring assembly as a composite spring unit having a central coil portion with first and second extended portions defined, respectively, by said first and second ends of said spring wire members; electrical contact means affixed to said first extended portion of said composite spring unit; support means comprising a support column affixed to said motor case and stop means arranged for engagement with said second extended portion of said composite spring unit; said composite spring unit being loosely mounted on said support column with said central coil portion thereof extending completely around said support column, with said electrical contact means in engagement with said commutator and with said second extended portion engaged against said stop means; said stop means being arranged to engage said second extended portion of said composite spring unit to hold said spring unit in spring compression between said commutator and said stop means with said composite spring unit being thereby held in place upon said support column to effect commutation of said motor.

4,163,917

ULTRASONIC TRANSDUCER WITH TEMPERATURE STABILITY DUE TO SELECTED DAMPING MATERIALS AND/OR ASSEMBLY METHODS

Walter E. Levine, Port Huron, Mich., assignor to Bindicator Company, Birmingham, Mich.

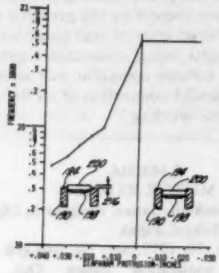
Division of Ser. No. 741,310, Nov. 12, 1976, Pat. No. 4,081,889, which is a division of Ser. No. 560,245, Mar. 20, 1975, Pat. No. 4,015,319. This application Nov. 25, 1977, Ser. No. 854,788

Int. Cl.[2] H01L *41/10*

U.S. Cl. 310—327 **18 Claims**

1. A transducer having a preselected resonant frequency comprising an open hollow shell and a vibratory element

having an element peripheral thickness and including a piezoelectric crystal, said element being received axially into an open end of said shell by interference press-fit to a depth in said



shell less than said peripheral thickness, said preselected resonant frequency being a function of said depth of interference press-fit.

4,163,918

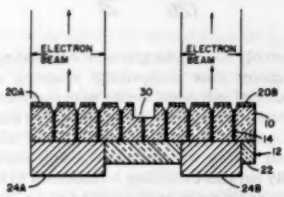
ELECTRON BEAM FORMING DEVICE

Joe Shelton, 700 Tatom St., NW., Huntsville, Ala. 35805

Filed Dec. 27, 1977, Ser. No. 864,348

Int. Cl.[2] H01J *1/02*

U.S. Cl. 313—309 **7 Claims**



1. An electron beam forming device for use in electron tubes, comprising a field effect electron emitter having first and second parallel surfaces, said first surface being a planar emitting surface for emitting electrons therefrom, said emitter having at least a million emitting fibers per square centimeter of emitting surface, said fibers being disposed in parallel; an insulating oxide matrix encompassing, supporting, and separating said fibers, respective first ends of said fibers terminating in said emitting surface below the surface plane of said oxide matrix; an accelerating electrode deposited on the surface plane of said oxide matrix in a plane substantially parallel with said surface plane for enhancing electron flow from said emitter; and a backing plate disposed on the second surface of said emitter adjoining respective second ends of said emitting fibers, said backing plate having selected conductor portions thereof for conducting an electrical potential to selective ones of said emitting fibers and thereby providing a selectively shaped electron beam when said accelerating electrode and said conductor portions are subjected to an electric field.

4,163,919

CATHODE RAY TUBE INTERNAL RESISTIVE COATING AND METHOD OF MANUFACTURE

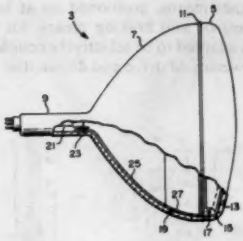
Kenneth Speigel, Seneca Falls, N.Y., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed May 8, 1978, Ser. No. 903,427

Int. Cl.[2] H01J *31/08*; H01B *1/08*

U.S. Cl. 313—479 **6 Claims**

1. In a cathode ray tube having an envelope with an apertured mask assembly therein and interconnected funnel and neck portions wherein the funnel portion has an anode button sealed therein and the neck portion has a mount assembly with affixed snubbers sealed therein, an improved resistive coating disposed on the internal surface of said envelope and contacting said snubbers of said mount assembly, said resistive coating derived from a suspension consisting essentially of electrically



conductive and insulative particles, silicate solids and an anionic wetting agent, sand conductive particles being in the range of about 10–45% by weight, said insulative particles in the range of about 30–60% of weight, said silicate solids in the range of about 20–45% by weight and said anionic wetting agent being an alkyl sulfonate in the range of about 0.0014 to 0.014% by weight of said coating.

4,163,920

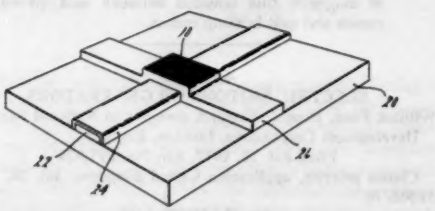
SOLID STATE SOURCE OF RADIANT ENERGY HAVING A CONTROLLABLE FREQUENCY SPECTRA CHARACTERISTIC

John J. Lambe, Birmingham, and Shaun L. McCarthy, Ann Arbor, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Sep. 26, 1977, Ser. No. 836,624

Int. Cl.[2] H05B *33/02*; H01L *33/00*

U.S. Cl. 313—503 **7 Claims**



1. A solid state source of radiant energy comprising a metal-insulator-metal tunnel junction wherein one of said metals defines an electrode and the other of the metals defines a counter-electrode containing a means for output coupling surface plasmon modes in response to applied voltage, and said junction thereby emits a visible light spectra having a high frequency cutoff value which is proportional to the value of the applied voltage.

4,163,921

INTERNALLY VANED TUBE CONSTRUCTION

Herman L. Myers, West Newton, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Dec. 9, 1977, Ser. No. 859,506

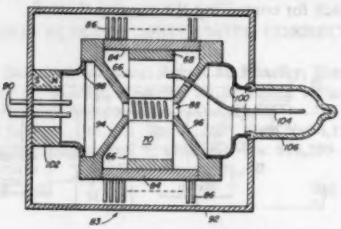
Int. Cl.[2] H01J *25/50*

U.S. Cl. 315—39.51 **8 Claims**

1. A method for forming a tubular structure comprising the steps of:

passing bar shaped material through a slot of a slotted man-

drel, said material extending outwardly beyond said mandrel exposing a portion of said material;
passing a ribbon spirally around said mandrel and said material and contacting said exposed portion of said material;
separating said material from said mandrel; and
fusing together said ribbon and said material to form said tubular structure.



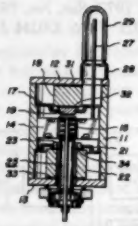
6. A magnetron comprising an anode having a spirally wound wall thereof and a set of vanes contacting said wall, said wall comprising a spiralling element, successive turns of said spiralling element of said wall contacting each other along a spiralling interface between successive turns.

4,163,922

MAGNETRONS

Masao Sakai, Mobara, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 22, 1978, Ser. No. 880,095
Claims priority, application Japan, Jun. 24, 1977, 52/82498[U]
Int. Cl.² H01J *25/50*
U.S. Cl. 315—39.71 **6 Claims**



1. In a magnetron comprising an anode cylinder, a pair of yokes secured to the opposite ends of said anode cylinder, said anode cylinder and said yokes forming an evacuated envelope, a plurality of vanes radially extending from the linear wall to said anode cylinder to define an interaction space, a cathode structure disposed in said interaction space, a supporting member secured to the inner wall of said anode cylinder, a permanent magnet and a pole piece interposed between one of said yokes and said supporting member, the improvement which comprises gaskets made of relatively soft electroconductive metal and interposed between said permanent magnet and members adjoining thereto.

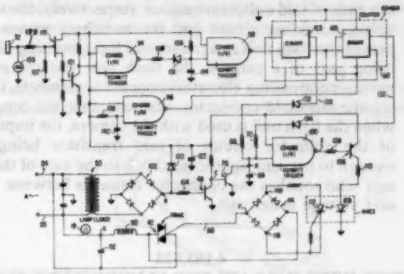
4,163,923

VARIABLE DUTY CYCLE LAMP CIRCUIT

Dennis M. Herbers, 550 Elvin Ave., Hamilton, Ohio 45013, and William H. Gibson, 142 E. 43rd St., Covington, Ky. 41015

Filed Mar. 15, 1977, Ser. No. 777,728
Int. Cl.² H05B *37/02, 39/04*
U.S. Cl. 315—208 **9 Claims**

1. A circuit for controlling the duty cycle applied to a load from an a.c. source, comprising in combination:
variable ramp rate sawtooth generator means for producing a sawtooth waveform whose ramp slope may be varied;
synchronizing means connected to said generator means for causing said sawtooth waveform to be synchronized with the a.c. source;
trigger means connected to said sawtooth waveform generator means for producing a train of output pulses whose time durations are dependent upon the ramp slope of the sawtooth waveform;



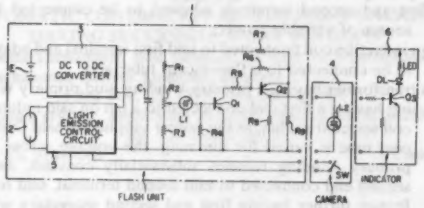
switch means connected to said output pulses for controlling the duty cycle of the load in accord with said time durations of the output pulses; and
control means connected to said generator means for selectively controlling said ramp slope, said control means comprising a counter having different output states connected to said generator means, and manually actuated means for incrementing said counter.

4,163,924

CIRCUIT FOR TURNING ON A CHARGING-COMPLETION INDICATOR SEPARATE FROM A FLASH UNIT

Hiroshi Hasegawa, Tokyo, and Tetsuro Goto, Funabashi, both of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Apr. 27, 1977, Ser. No. 791,183
Claims priority, application Japan, Apr. 30, 1976, 51-53416[U]
Int. Cl.² H05B *41/32*
U.S. Cl. 315—241 P **4 Claims**



1. In a flash unit wherein a main capacitor is charged from the output of a DC-DC converter to store the energy for causing a flash lamp to emit light, and wherein a first light-emitting element connected to the output of said converter by a voltage dividing circuit is energized when the capacitor voltage has reached a predetermined value, to indicate the completion of charging of the main capacitor, the improvement comprising:
a second voltage dividing circuit connected to the output of said DC-DC converter and operable to produce a high-impedance signal whose voltage is greater than the turn-on voltage of a second light-emitting element separate from said flash unit; and
switching means for rendering said second voltage dividing

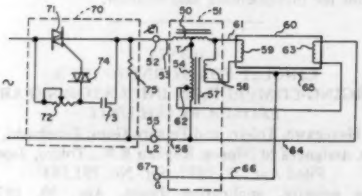
circuit operative to produce said high-impedance signal upon energization of said first light-emitting element,

said second voltage dividing circuit having a transistor with a base connected to said switching means and responsive thereto for rendering the transistor conductive, with an emitter connected to an intermediate point in said second voltage dividing circuit, and with a collector connected to said DC-DC converter through a collector resistor, the voltage of said high-impedance signal being derived between electrical connector elements connected to opposite ends of said collector resistor, respectively, the second voltage dividing circuit and the switching means being part of the flash unit and the second light-emitting element being part of a camera, the flash unit and the camera having cooperating electrical connector elements, including the aforesaid connector elements, that are connected when the flash unit is used with the camera, the impedance of the collector circuit of said transistor being high enough to prevent significant shock to the user of the flash unit who touches the connector elements between which said voltage is derived.

4,163,925
TWO-WIRE BALLAST FOR FLUORESCENT TUBE DIMMING

Zoltan L. Gyursanszky, Don Mills, Canada, assignor to Honeywell Ltd., Scarborough, Canada

Filed Feb. 6, 1978, Ser. No. 875,478
Claims priority, application Canada, Apr. 21, 1977, 276641
Int. Cl.[2] H05B *41/38, 41/20*
U.S. Cl. 315—276 **18 Claims**



1. A ballast for a fluorescent tube dimming arrangement comprising:

first and second terminals adapted to be connected to a source of variable power;

an inductive coil connected to said first terminal and adapted to be connected to a fluorescent tube; and,

a transformer having a primary winding, said primary winding having a first end connected to a tap on said inductive coil selected so that, as the power supplied to said fluorescent tube is varied for dimming, the voltage across said primary winding remains substantially constant, and a second end connected to said second terminal, said transformer further having first and second secondary windings for supplying filament voltage to said fluorescent tube.

4,163,926
SWITCHING REGULATOR FOR A TELEVISION APPARATUS

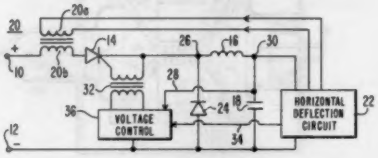
Donald H. Willis, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Sep. 7, 1978, Ser. No. 940,286
Int. Cl.[2] H01J *29/70, 29/76*
U.S. Cl. 315—408 **8 Claims**

1. A switching regulator for a television apparatus, comprising:

a controllable switch, an inductor and a horizontal deflection generator forming a first series circuit coupled across a source of unregulated direct voltage for providing a path for an increasing current flow in said inductor during those intervals in which said switch is closed, said switch including a gate and a main current conduction path which when forward biased remains open until a signal is applied to said gate and which thereafter remains closed so long as said forward bias is maintained;

coupling means coupling horizontal rate signals from said deflection generator to said main conduction path of said switch for controlling the opening thereof;



a diode coupled with said inductor to form a path for a decreasing current flow in said inductor during at least a portion of those intervals in which said switch is opened;

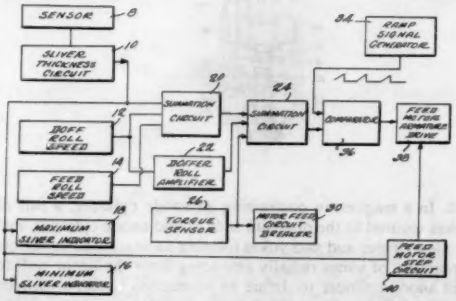
a capacitor coupled to said deflection generator for filtering said current flow in said inductor to form an operating voltage for said deflection generator; and

control means coupled to said deflection generator and to said gate for controlling the closing of said switch for controlling the average of said increasing and decreasing currents in said inductor and thereby controlling said operating voltage in a feedback manner.

4,163,927
AUTO-LEVELER CIRCUIT

Karl R. Grice, Jr., Honea Path, S.C., assignor to Fiber Controls Corporation, Gastonia, N.C.

Filed May 4, 1977, Ser. No. 793,759
Int. Cl.[2] H02P *5/46*; D02H *5/38*
U.S. Cl. 318—68 **12 Claims**



1. A circuit for producing an electrical control signal for controlling the speed of a first roller driven by a first motor in an apparatus for producing a sliver of uniform density, which apparatus includes means for producing a signal indicating sliver thickness and a second roller driven by a second motor so that the speed difference between the rollers determines sliver thickness comprising:

means for producing a first signal which varies as a function of sliver thickness;

means for producing a second signal which varies as a function of the speed of the first roller;

means for producing a third signal which varies as a function of the speed of the second roller;

means for producing a fourth signal which varies as a function of the difference between said second and third signals;

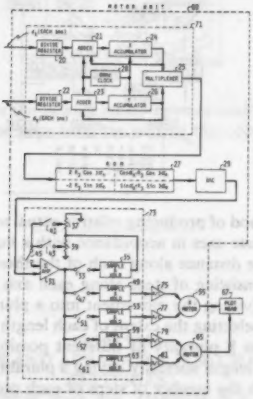
means for producing a sixth signal which varies as a function of the torque of one of said motors;
means for combining said sixth, fourth and first signals to produce a control signal;
means for generating a train of ramp signals; and
means for comparing said ramp signal and said control signal to produce a drive signal for driving one of said motors.

4,163,928

OPEN-LOOP ELECTRIC DRIVE WITH CORRECTIVE CONTROLLER

Marvin L. Patterson, Ramona; Robert D. Haselby, Escondido, and Albert P. Kendig, Ramona, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Division of Ser. No. 756,679, Jan. 4, 1977, Pat. No. 4,115,726.
This application Feb. 9, 1978, Ser. No. 876,399
Int. Cl.[2] G05B *19/24*
U.S. Cl. 318—573 **16 Claims**



1. Positioning apparatus for controlling an inductor-type synchronous motor having a stationary portion with a plurality of current-responsive windings and a movable portion which moves relative to the stationary portion in response to signals applied to the windings in a selected phase relationship, said apparatus comprising:
interpolator means for producing a control signal in response to an applied signal, said applied signal being representative of a desired movement at a selected velocity;
memory means coupled to said interpolator means and having pre-stored manifestations of preselected signal waveforms in a plurality of memory locations for progressively producing selected ones of said manifestations in response to said control signal; and
means coupled to said memory means for converting said selected manifestations to phase currents, the phase currents being applicable to the windings of the motor for causing the movable portion to move at a substantially uniform velocity to a position proportional to the applied signal.

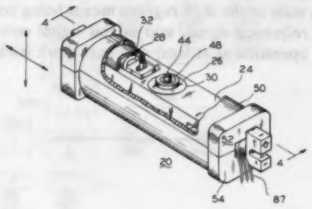
4,163,929

HANDLE APPARATUS FOR A POWER-ASSIST DEVICE

Maria M. Janu, Brookfield, and Howard R. Wagner, Milwaukee, both of Wis., assignors to General Electric Company, Milwaukee, Wis.

Filed Jul. 28, 1978, Ser. No. 929,001
Int. Cl.[2] G05B *11/01*
U.S. Cl. 318—628 **7 Claims**

1. A handle apparatus havng an input signal and producing an error signal for use with a device which has a movable component and variable speed motor means which is responsive to the error signal operatively connected to the component for driving it to desired positions corresponding to the error signal, wherein said handle apparatus is manually engageable and subject to having a manual force applied substantially in the direction in which movement of said component is desired, said handle apparatus comprising:
a central stationary support member having means for being fixedly mounted to the component,
said support member being adapted to receive a miniature force sensor which includes a linear variable differential transformer having an operative axis, said member having one said force sensor for each axis in which power-assist is desired with the axis of each said force sensor positioned corresponding to each axis in which power-assist is desired,
said force sensor being electrically connected to the input signal and having an actuator translatable along the operative axis connected to a central core, and having a base containing the transformer wherein movement of said actuator translates the core within the transformer to produce the error signal corresponding to the magnitude and direction of the translation of the core,



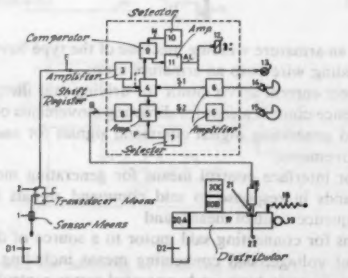
a generally hollow cylindrical sleeve, enclosing said support member and each said miniature force sensor, forming a manually engageable surface,
means for said sleeve to independently engage each said actuator, and
means for positioning and returning said sleeve to a stable position and having elastic resistance to force in any direction whereby any said manual force applied to said sleeve translates said actuator to thus produce said error signal which is proportional to the magnitude and direction of said force.

4,163,930

AUTOMATIC CONTROL APPARATUS FOR A MACHINE HAVING SUCCESSIVE WORK STATIONS

Maurice Lachaussee, Ans, Belgium, assignor to Etablissements Lachaussee, Societe Anonyme, Belgium

Filed Dec. 22, 1977, Ser. No. 863,597
Claims priority, application Belgium, Dec. 28, 1976, 173695
Int. Cl.[2] G05B *11/32*
U.S. Cl. 318—563 **5 Claims**



1. A control apparatus for controlling the sequences of

operations executed at successive work stations on a machine, the path between the work stations being subdivided into a number of steps, said control apparatus comprising at each work station:

detecting means arranged for detecting the correct completion of an operation and generating a fault signal when the operation is not correctly completed,

shift register means connected for accepting the fault signal from the detecting means in response to a timed control signal and advancing said fault signal step by step under control of said control signal,

comparator means connected for comparing the successive states of the shift register means with a reference signal representing the number of travel steps between the present work station and the next, this comparator means being arranged for producing an inhibit signal in response to a state of the shift register means being coincident with the reference signal, said inhibit signal serving to inhibit the operation at at least one next work station.

4,163,931

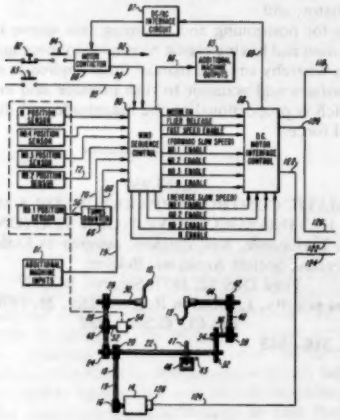
ARMATURE WINDING MACHINE

David R. Seitz, Dayton, and Mark T. Heaton, Springfield, both of Ohio, assignors to The Globe Tool and Engineering Company, Dayton, Ohio

Filed Nov. 1, 1976, Ser. No. 737,284

Int. Cl.[2] G05B *19/18*

U.S. Cl. 318—569 **18 Claims**



1. In an armature winding machine of the type having a flier for winding wire onto an armature core;

a direct current servo motor for driving said flier;

sequence control means for directing movements of said flier and generating digital command signals for each of said movements;

motor interface control means for generating motor commands in response to said command signals from said sequence control means; and

means for connecting said motor to a source of direct current voltage, said connecting means including high frequency switching mode operated servo controller means for causing said source to drive said motor in response to said motor commands.

4,163,932

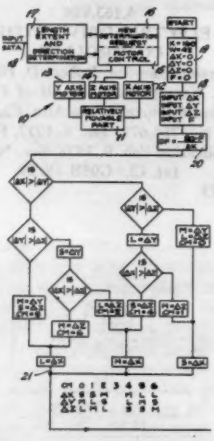
NUMERICAL CONTROL SYSTEM AND METHOD FOR A THREE AXES MOVEMENT

Albert C. Leenhouts, Harwinton, Conn., assignor to The Superior Electric Company, Bristol, Conn.

Filed Oct. 7, 1974, Ser. No. 512,665

Int. Cl.[2] G05B *19/24*

U.S. Cl. 318—573 **17 Claims**



1. The method of producing relative actual movement along three coordinate axes in accordance with a commanded path defined by the distance along each of the three axes with the movement consisting of steps along each axis comprising the steps of subdividing the movement into a plurality of successive lengths, selecting the extent of each length along each axis normally from a plurality of different possible lengths with each possible length normally having a plurality of steps along each axis with the number of steps of each possible length on each axis being no greater than an absolute numerical value of one from the number of steps in the immediately prior length on the same axis and producing a relative movement essentially simultaneously along each axis equal to their respective extents in the selected length with the movement for each length occurring in the same constant time interval.

4,163,933

AUTOMATIC ELECTRIC BATTERY CHARGING APPARATUS

George W. Foster, Bolton, England, assignor to Chloride Group Limited, London, England

Filed Nov. 21, 1977, Ser. No. 853,425

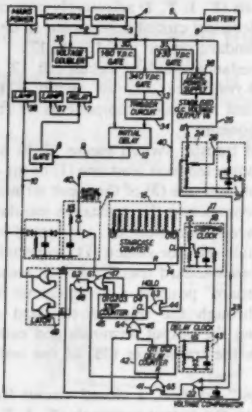
Claims priority, application United Kingdom, Nov. 24, 1976, 49001/76

Int. Cl.[2] H02J *7/04*

U.S. Cl. 320—20 **12 Claims**

1. Automatic electric battery charging apparatus comprising at least one timer, a voltage comparator arranged to compare a reference voltage, referred to herein as a staircase voltage, with a control signal varying with battery voltage, jacking means rendered operative by the timer when a first predetermined time interval has elapsed and serving to repeatedly increase the staircase voltage step-by-step relatively to the control signal, by equal steps, so long as the control signal

exceeds the reference voltage, and terminating means for initiating the termination if the staircase voltage exceeds the control signal before the jacking means have exceeded a predetermined number of steps from the start of their operation.

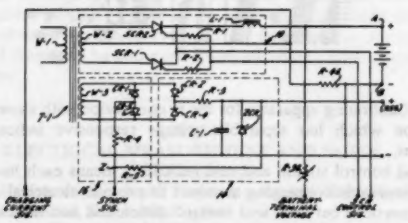


4,163,934

METHODS AND APPARATUS FOR CHARGING BATTERIES

Francis Lawn, 378 W. Park Ave., Oakhurst, N.J. 07755

Filed Jul. 6, 1977, Ser. No. 813,265
Int. Cl.[2] H02J 7/04
U.S. Cl. 320—23 **19 Claims**



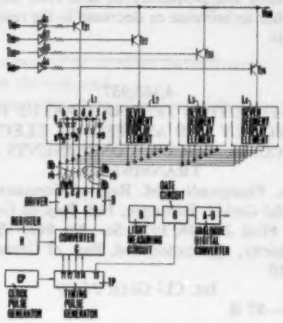
1. The method of charging a battery whose charging cycle is characterized by a rising voltage-versus-time charging curve including a decreased-slope bend when it is fully charged, which includes the steps of supplying relatively high charging current to the battery during an initial phase and reduced charging current to the battery later in the charging cycle, periodically testing the slope of the voltage-versus-time charging curve during both said phases while continuing to supply charging current, deriving a representation of the charging current, smoothing and utilizing that representation in regulating the charging current within limits ensuring a minimum battery-voltage increment during each slope-testing interval for a sound battery that is not fully charged, and terminating the charging cycle after a slope test that shows less than a predetermined battery-voltage increment.

4,163,935

APPARATUS FOR CHECKING A BATTERY VOLTAGE

Nobuaki Sakurada, Yokohama; Yukio Mashimo, Tokyo; Tadashi Ito; Fumio Ito, both of Yokohama, and Nobuhiko Shinoda, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Japan

Continuation of Ser. No. 741,935, Nov. 15, 1976, abandoned, which is a continuation of Ser. No. 555,823, Mar. 6, 1975, abandoned. This application Feb. 17, 1978, Ser. No. 878,774
Int. Cl.[2] G01N 27/42
U.S. Cl. 324—29.5 **7 Claims**



1. An apparatus for checking the driving voltage of a battery in a digital display device comprising:

(a) a digital display device including in addition to the battery whose output voltage is to be checked: (1) a first means for producing a control signal corresponding to a normal pattern to be displayed; (2) a plurality of series circuits connected in parallel with one another to said battery, each circuit having at least one light emitting diode which forms at least one part of said normal pattern and also having a driving means which controls illumination of the light emitting diode in response to the control signal from said first means; and

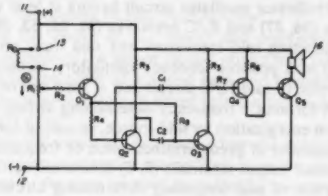
(b) diode means connected in series between at least one of said light emitting diodes and said driving means for controlling the illumination of the light emitting diode provided in said circuit so as to assure that the output of said battery, when its terminal voltage is below a predetermined value, makes the pattern into a special symbol different from the normal pattern provided in accordance with the control signal.

4,163,936

AUDIBLE TESTER FOR ALARM CIRCUITS

Richard B. Shufro, 20 Highland St., Sharon, Mass. 02067

Filed Sep. 19, 1977, Ser. No. 834,406
Int. Cl.[2] G01R 31/02
U.S. Cl. 324—51 **1 Claim**



1. A device for isolating or locating faults in a series alarm circuit by detecting slight changes in the resistance thereof, said device comprising a speaker, an amplifier connected to said speaker, a multivibrator, the output of which is connected

to said amplifier, a second amplifier connected to the input of said multivibrator for changing the frequency of said multivibrator, a pair of test terminals for connection to an alarm circuit and constituting input terminals to said device, means including a variable resistor coupling one of said terminals to the control element of said second amplifier, and a power supply connected across said test terminals and said means, the parameters of the components of said device being so selected that said variable resistance means can be adjusted to provide a continuous minimum frequency tone output from said speaker when said terminals are connected across said alarm circuit, whereby the frequency of said tone increases in response to either an increase or decrease in the resistance across said terminals.

4,163,937
MULTI-FUNCTION TEST APPARATUS TO TEST, SELECTIVELY AND AS DESIRED, ELECTRICAL CIRCUITS, CIRCUIT COMPONENTS AND TRANSISTORS

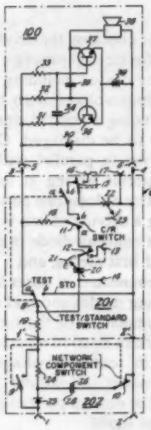
Heinz Laass, Pfungstadt, Fed. Rep. of Germany, assignor to TACO-Tafel GmbH, Esslingen, Fed. Rep. of Germany

Filed Jan. 16, 1978, Ser. No. 869,778

Claims priority, application Fed. Rep. of Germany, Jan. 31, 1977, 2703880

Int. Cl.[2] G01R *27/00*

U.S. Cl. 324—57 R **37 Claims**



1. Multi-function test apparatus to test, selectively and as desired, electrical circuits and circuit components comprising the combination of

an acoustic output electrical tester (**100**) and a multi-function testing circuit (**200**) therefor,

wherein said acoustic output electrical tester (**100**) comprises

a local power source (**39**);

an a-c - audible signal transducer (**38**);

a multivibrator oscillator circuit having at least two transistors (**36, 37**) and R/C networks (**31, 32, 33, 34, 35**) interconnecting said transistors and said local power source (**39**) in a positive feedback oscillatory circuit, at least a portion of said R/C circuit and at least one of the transistors forming a frequency determining circuit to provide, upon energization by said source, an output tone from said transducer of predetermined pitch or frequency;

and tester output terminals (**5, 6**) connected across at least a portion of said frequency determining circuit to modify the frequency of oscillation of said multivibrator circuit and hence the pitch of the tone reproduced by the transducer upon connection of impedances to said test terminals;

and wherein, in accordance with the invention,

the multi-function testing circuit (**200**) comprises

input terminals (**3, 4**) connectable with the acoustic tester output terminals (**5, 6**);

output terminals (**1', 1; 2', 2**) selectively connectable with a circuit or electrical circuit component to be tested;

a resistance standard circuit (**22; 15, 16, 17**);

a reactive impedance standard circuit (**20; 12, 13, 14**);

an impedance-resistance selector switch (**11**) selectively settable to test resistance components or reactive impedance components;

a test-standard transfer switch means (**7, 8**) having switch terminals connected to at least one (**1**) of the output terminals (**1, 2**), at least one (**3**) of the input terminals (**3, 4**) and selectively connecting the resistance standard circuit, or the impedance standard circuit, as selected by said impedance-resistance selector switch (**11**) to permit establishing when said test-standard transfer switch means is

(a) in the "standard" position, a closed circuit from the input terminals through the selected standard circuit while disconnecting the output terminals and cause generation of a tone in the transducer (**38**) of the tester (**100**); and when

(b) in the "test" position, a closed circuit from the input terminals (**3, 4**) to the output terminals (**1', 1; 2', 2**), and thus permit comparison of the pitch of the tone from the transducer (**38**) of the tester (**100**) as the transfer switch is operated, and hence a judgment of deviation of the tone from the transducer when the connection is changed, respectively, between the standard circuit and a test component connected to the output terminals.

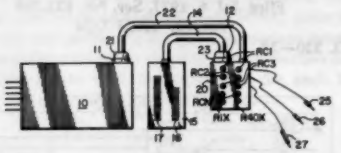
4,163,938
CALIBRATING DEVICE FOR CONTROL STATIONS AND INDICATORS

James O. Moore, Worcester, Pa., assignor to Moore Products Co., Spring House, Pa.

Filed May 1, 1978, Ser. No. 901,414

Int. Cl.[2] G01R *1/38, 1/02, 35/00*

U.S. Cl. 324—74 **4 Claims**



1. Calibrating apparatus for use in connection with a control station which has separable voltage responsive indicating means,

said control station and said indicating means each having separable connecting members to provide electrical connections between said control station and said indicating means,

said calibrating apparatus comprising

a housing for interposition between said control station and said indicating means said housing containing internal circuit means with accessible connectors to which said connecting members are respectively connected, said internal circuit means communicating with said indicating means through said connecting members,

said internal circuit means including means for providing a plurality of sources of different reference voltages, said internal circuit means being powered by said control station, said internal circuit means having a plurality of terminals to which the plurality of sources of different reference voltages are applied said terminals being accessible through the housing, and

test leads for selective connection to selected terminals for connection of said indicating means to selected ones of

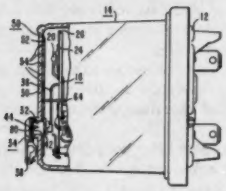
said different reference voltages to determine the response of the indicating means thereto.

4,163,939

ANTI-STATIC PLASTIC ENCLOSURE FOR ELECTRIC UTILITY METERS

Kenneth G. Halstead, and James D. Hawfield, Jr., both of Raleigh, N.C., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 6, 1978, Ser. No. 875,668
Int. Cl.[2] H02B 9/00
U.S. Cl. 324—104 **6 Claims**



1. An anti-static enclosure enclosing an electric utility meter including a chassis having conductive portions and carrying an elongated dial pointer at the front thereof, said enclosure comprising: a non-conductive base for carrying the meter chassis such that said chassis projects forwardly of said base; and a transparent cup-shaped plastic cover surrounding the forward projecting parts of the chassis carried by said base with said cover including a rear portion terminating at an open end detachably mounted to said base, and further including a closed end defining a cover front portion adjacently covering the chassis front and said dial pointer, said cover front portion including a separable static shielding plate having an electroconductive layer extending over the inside of said cover front portion at least throughout an area equal to the area of movement of said dial pointer, and said static shielding plate including a contact member projecting therefrom and terminating at a free end extending into the interior of said enclosure, said contact member having a predetermined projecting length and a predetermined position at said cover front portion, said contact member extending into electrical connection with a conductive portion of said chassis, whereby electrostatic electrical charges developed at said cover front portion are conducted therefrom by said static shielding plate and said contact member.

4,163,940

ELECTRICAL MEASUREMENT AND NOISE SUPPRESSION

David Brewerton, Bracknell, England, assignor to Racal Instruments Limited, Bracknell, England

Filed Apr. 12, 1976, Ser. No. 675,863
Claims priority, application United Kingdom, Sep. 15, 1975, 37901/75
Int. Cl.[2] G01R 15/10; H04B 1/04
U.S. Cl. 324—132 **5 Claims**

2. Electrical measurement circuitry for measuring an input signal of undetermined frequency, comprising

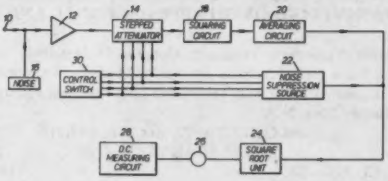
sampling means connected to periodically sample the input signal whereby to produce a succession of samples of the input signal,

storage means connected to receive the samples and to temporarily store the level of each sample until the next sample is received whereby to derive a variable waveform dependent on the changes in level of the said samples,

squaring means for taking the mean square value of the said variable signal and the noise thereon so as to produce an output including a mean square noise component,

a d.c. signal source settable to produce a d.c. signal,

means subtracting the d.c. signal from the output of the



squaring means so as to offset the said mean square noise component thereof, and

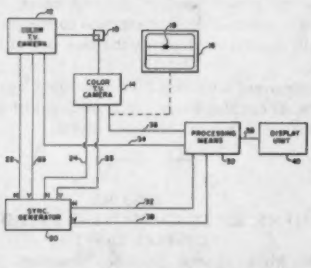
means for measuring the square root of the resultant signal.

4,163,941

VIDEO SPEED ANALYZER OF GOLF CLUB SWING OR THE LIKE

Roy N. Linn, Jr., 4 Laurel Dr., Danville, Ill. 61832

Filed Oct. 31, 1977, Ser. No. 846,801
Int. Cl.[2] G01P 3/68
U.S. Cl. 324—178 **13 Claims**



1. A method for measuring the velocity of an object such as the head of a swinging golf club moving within a field of view which comprises:

A. coloring the object a single predetermined color;

B. providing a television camera with scanning and color responsive video circuitry responsive primarily to said predetermined color;

C. directing the camera to said field of view;

D. scanning the image of the object and converting the resulting signals of the image of said object into pulses;

E. Synthesizing an array of scanned lines and transforming said pulses onto said lines in timed relation to the generation of said lines;

F. computing the pulse displacement when the pulse is displaced between repeated scanning lines on said array with due regard to the time interval between the generation of said scan lines;

G. deriving a computation of the velocity determined by the pulse displacement and;

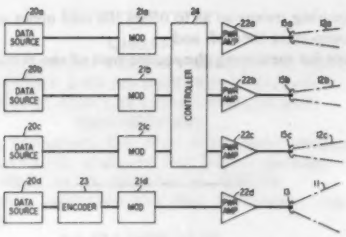
H. providing a readout signal corresponding to said velocity.

4,163,942

METHOD AND APPARATUS FOR EFFECTING COMMUNICATION WITH RECEIVERS DISPOSED IN BLACKOUT REGIONS FORMED BY CONCURRENTLY TRANSMITTED OVERLAPPING GLOBAL AND SPOT BEAMS

Anthony Acampora, Freehold; Douglas O. Reudink, Sea Girt, and Yu S. Yeh, Freehold Township, Monmouth County., all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 17, 1977, Ser. No. 842,416
Int. Cl.[2] H04B *15/00, 1/00*
U.S. Cl. 325—52 **14 Claims**



1. A method of effecting communication with a receiver disposed within a blackout region caused by interference between signals in a first and a second antenna radiated beam which use the same frequency spectrum and overlap each other in their respective receiver areas, the method comprising the steps of:

(a) concurrently transmitting the first and the second antenna radiated beams;

(b) selectively terminating transmission of the second beam during a predetermined interval of time while ensuring that the power level of the first beam in the blackout region substantially corresponds to the power level normally encountered across the majority of the first beam; and

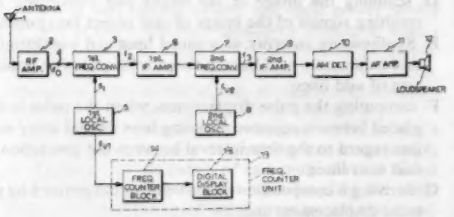
(c) concurrent with step (b) transmitting signals in the first antenna radiated beam which are destined for the receiver disposed within the blackout region.

4,163,943

RADIO RECEIVER EMPLOYING PREMIXING AND DIGITAL DISPLAY

Sukeichi Miki, Ikoma; Shuichi Ninomiya, Kodoma; Shin Fukuda, and Yukio Sugimoto, both of Katano, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 7, 1977, Ser. No. 804,461
Claims priority, application Japan, Jun. 14, 1976, 51/69947; Jul. 6, 1976, 51/80509; Jul. 6, 1976, 51/80510
Int. Cl.[2] H04B *1/16, 1/26*
U.S. Cl. 325—433 **3 Claims**



1. A radio receiver comprising:

an input terminal to which a received signal having a frequency band centered about a frequency f_o is applied;

a variable frequency oscillator for producing a signal having an adjustable frequency f_v;

a first reference oscillator for producing a signal having a fixed frequency f_{R1} which is higher than the upper limit of said frequency band of said received signal;

a first premixer connected to said variable frequency oscillator and said first reference oscillator for mixing the signals of said variable frequency oscillator and said first reference oscillator;

a first band pass filter connected to said first premixer for passing a frequency which is the algebraic sum of the frequency of said variable frequency oscillator and the frequency of said first reference oscillator;

a second reference oscillator for producing a signal having a fixed frequency f_{R2};

a second premixer connected to said first band pass filter and said second reference oscillator for mixing the signals of said first band pass filter and said second reference oscillator;

a second band pass filter connected to said second premixer for passing a frequency which is the algebraic sum of the frequency passed by said first band pass filter and the frequency of said second reference oscillator;

a frequency converter connected to said input terminal and said second band pass filter for mixing the signals of said input terminal and said second band pass filter and producing a signal at an intermediate which is the difference of the frequency of said input terminal and the frequency of said second band pass filter;

an intermediate frequency amplifier connected to said frequency converter for amplifying the signal of said frequency converter at the intermediate frequency; and

wherein:

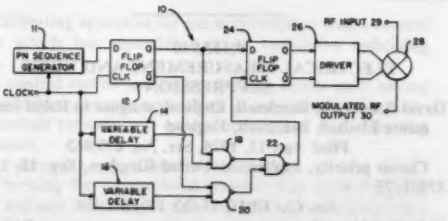
said variable frequency oscillator has a variable tuning circuit having a range of frequencies equal to twice the intermediate frequency.

4,163,944

COMPENSATION CIRCUIT FOR AN ELECTRICAL SIGNAL MIXER

Ramon P. Chambers, Clearwater; Robert S. Gordy, Largo; David E. Sanders, and Cameron E. Morrison, both of St. Petersburg, all of Fla., assignors to NCR Corporation, Dayton, Ohio

Filed Dec. 22, 1976, Ser. No. 753,388
Int. Cl.[2] H04B *1/10*
U.S. Cl. 325—446 **8 Claims**



1. A compensating circuit for an electrical mixer comprising:

a double-balanced mixer having first and second inputs, said first input adapted to receive an input signal;

a modulating signal source for providing a modulating signal having at least two states;

adjustable delay means responsive to a synchronizing component of said modulating signal for providing first and second adjustable delayed synchronizing signal components, corresponding to respective states of said modulating signal; and

means responsive to said provided delayed signal for operatively connecting said provided modulating signal to said

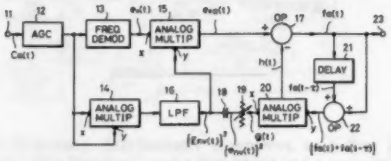
double-balanced mixer such that the electrical imbalance in said double-balanced mixer is minimized by adjusting said adjustable delay means.

4,163,945

SYSTEM FOR REMOVING INTERFERENCE DISTORTION IN THE DEMODULATED SIGNAL OF A FREQUENCY-MODULATED SIGNAL

Yukinobu Ishigaki, Yamato, and Teruo Muraoka, Yokohama, both of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Jun. 13, 1978, Ser. No. 915,212
Claims priority, application Japan, Jun. 14, 1977, 52-70255
Int. Cl.² H04B 1/10
U.S. Cl. 325—473 **6 Claims**



1. A system for removing interference distortion in the demodulated signal of a frequency-modulated signal comprising:

means for demodulating an input frequency-modulated signal Ca(t) which has been subjected to interference by another frequency-modulated signal, and thereby obtaining a demodulated signal $e_d(t)$;

squaring means for obtaining a signal in which said input frequency-modulated signal is squared;

means supplied with said squared signal and detecting an envelope of said input frequency-modulated signal in square characteristics, and thereby producing as output a squared envelope signal $\{Env(t)\}^2$;

means supplied with the demodulated signal $e_d(t)$ from said demodulating means and with the squared envelope signal $\{Env(t)\}^2$ from said producing means, and thereby producing as output a signal $e_{oo}(t)$ of the product of both signals;

means for suppressing DC component of said squared envelope signal $\{Env(t)\}^2$, and thereby obtaining only AC component;

first operation means supplied with said product signal $e_{oo}(t)$;

delay means for delaying an output signal of said first operation means by a specific delay time;

second operation means for adding the output signal of said first operation means and the output signal of said delay means;

means for carrying out multiplication of said AC component signal $\{env(t)\}^2$ and the output signal of said second operation means, and thereby supplying the resulting output signal h(t) to said first operation means, said first operation means being substantially carrying out subtraction of said signal $e_{oo}(t)$ and said signal h(t); and

means for obtaining from said first operation means as a demodulated signal in which the interference distortion has been substantially cancelled and thus removed.

4,163,946

NOISE-IMMUNE MASTER TIMING GENERATOR

Steven L. Alberts, Kent, Wash., assignor to GTE Sylvania Incorporated, Stamford, Conn.

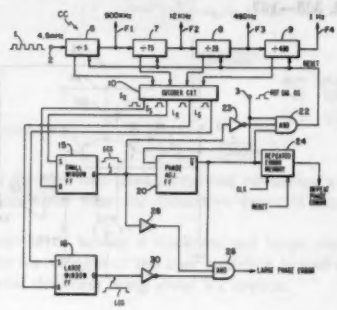
Filed Jun. 2, 1978, Ser. No. 911,851
Int. Cl.² H03K 1/18
U.S. Cl. 328—63 **20 Claims**

1. A master timing generator comprising:

counting means operable to perform repetitive counting operations and having a reset input by which the counting means may be reset;

first circuit means coupled to the counting means and operative to derive a plurality of gate signals in succession from the counting means, each of said gate signals being of a predetermined first duration;

an input terminal adapted to receive a plurality of reference signals in succession and corresponding to the plurality of gate signals derived by the first circuit means, each of said reference signals being of a second duration less than the first duration of a gate signal derived by the first circuit means; and



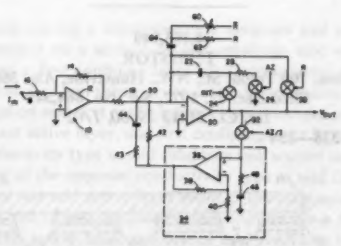
second circuit means coupled to the input terminal for receiving each reference signal, to the first circuit means for receiving each gate signal, and to the reset input of the counting means, said second circuit means being operative to ascertain the time of occurrence of each reference signal with respect to its corresponding gate signal and if successive ones of the reference signals occur outside of their corresponding gate signals to produce and apply a reset signal to the reset input of the counting means for resetting the counting means.

4,163,947

CURRENT AND VOLTAGE AUTOZEROING INTEGRATOR

Hans J. Weedon, Salem, Mass., assignor to Analogic Corporation, Wakefield, Mass.

Filed Sep. 23, 1977, Ser. No. 835,967
Int. Cl.² G06G 7/18
U.S. Cl. 328—128 **11 Claims**



1. An autozeroing integrator, comprising:

an integrator, having an input terminal and an output terminal, for integrating during an integrating period an input signal applied to the input terminal, including:

a high-gain, differential amplifier having an offset voltage;

an integrating capacitor; and

means for periodically connecting the capacitor between the output of the differential amplifier and an input of

the differential amplifier during the integrating period; and

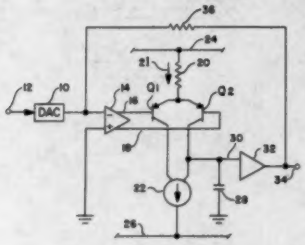
means for charging the integrating capacitor to a voltage equal to the input offset voltage in the differential amplifier.

4,163,948

FILTER FOR DIGITAL-TO-ANALOG CONVERTER

Michael L. Rieger, Tigard, and Martin D. Singer, Beaverton, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Continuation of Ser. No. 786,166, Apr. 11, 1977, abandoned.
This application Apr. 27, 1978, Ser. No. 900,557
Int. Cl.[2] H03K *5/08*
U.S. Cl. 328—167 **6 Claims**



1. A non-linear filter for attenuating spurious electronic signals, the filter comprising:

circuit input means for receiving the signals to be attenuated;

first amplifier means coupled to said circuit input means for amplifying the signals to be attenuated and including means for providing the amplified signals as double-ended signals;

second amplifier means coupled to receive said double-ended signals for providing a single ended output signal, said second amplifier means including constant current source means for providing a constant current;

current mirror means coupled to receive said single-ended output signal for sinking said constant current;

a capacitor coupled to receive at least a portion of said constant current for producing a terminal voltage thereacross in accordance with said constant current received;

buffer amplifier means responsive to said terminal voltage for applying said terminal voltage to a circuit output means; and

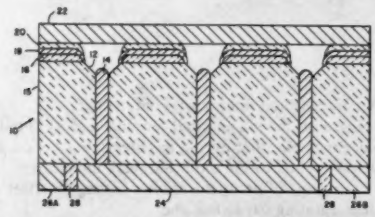
feedback means coupled between said circuit input means and said circuit output means for feeding at least a portion of said terminal voltage to said first amplifier means for controlling the amplitude of said terminal voltage.

4,163,949

TUBISTOR

Joe Shelton, 700 Tatom St., NW., Hunstville, Ala. 35805

Filed Dec. 27, 1977, Ser. No. 864,349
Int. Cl.[2] H01J *29/00, 1/02*
U.S. Cl. 328—254 **9 Claims**



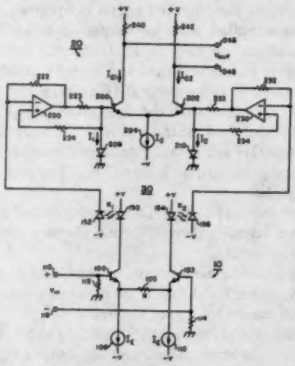
1. A field effect electron device for providing selectably controlled electron emission comprising a metal-oxide field effect electron emitter, said emitter being a plurality of metal rods in a non-conducting oxide having first and second parallel surfaces, said metal rods disposed therein at a density in excess of one million emitting rods per square centimeter of surface area, said rods being uniformly spaced in parallel for field emission of electrons from a first end thereof, each of said rods having emitting ends conically recessed below the first surface of the emitter oxide parallel surfaces; a thin film insulating layer deposited on the first surface of said emitter oxide; a thin film conductive layer deposited on said insulating layer; and said emitter rod ends and said conductive layer being disposed in respective planes separated by not more than a micron for providing rapid electron transport between said planes when a potential is applied between the emitter and the conductive layer.

4,163,950

ISOLATING DIFFERENTIAL AMPLIFIER

Wendell W. Damm, and Choong R. Kim, both of Aloha, Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Mar. 1, 1978, Ser. No. 882,532
Int. Cl.[2] H03F *17/00, 3/45*
U.S. Cl. 330—252 **4 Claims**



1. An isolating differential amplifier, comprising:

an input differential amplifier stage comprising a first pair of emitter coupled transistors, a resistor having a predetermined resistance value connected between the emitters of said transistors, and a pair of constant current sinks, each of which is connected to a respective emitter, said input differential amplifier stage for receiving an input signal at the bases of said first pair of transistors and producing a differential signal therefrom;

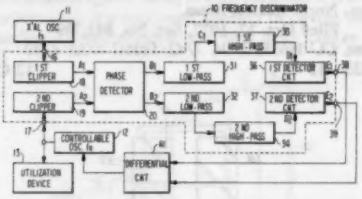
an output differential stage comprising a second pair of emittercoupled transistors and a constant current sink connected to both emitters of said second pair of transistors, said output differential amplifier stage being responsive to said differential signal for producing an output signal; and

optical coupling means for coupling said differential signal from the collectors of said first pair of emitter coupled transistors to the bases of said second pair of emitter coupled transistors.

4,163,951
FREQUENCY DISCRIMINATOR PRODUCING AT LEAST ONE OF TWO PULSE SEQUENCES REPRESENTING IN AVERAGE THE RESULT OF FREQUENCY DISCRIMINATION

Shigenobu Aihara; Isao Haga, and Motoo Mizumura, all of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Mar. 15, 1978, Ser. No. 886,699
Claims priority, application Japan, Mar. 15, 1977, 52-27571
Int. Cl.[2] H03B 3/04; H03K 5/20
U.S. Cl. 331—1 A **6 Claims**



1. A frequency discriminator responsive to a first input signal of a first frequency and a first phase and a second input signal of a second frequency and a second phase for producing a discriminator output signal representative of the difference between said first and said second frequencies in a predetermined one of two cases where said first frequency is either greater than or lower than said second frequency, said first and said second frequencies being greater than a predetermined frequency, said frequency discriminator comprising:

phase detector means responsive to said first and said second input signals for producing first and second substantially rectangular pulse sequences, said first substantially rectangular pulse sequence taking a predetermined peak value with an instantaneous frequency corresponding to the difference between said first and said second phases while said second substantially rectangular pulse sequence continuously has said peak value if said first phase leads said second phase by 0° through 180°, said second substantially rectangular pulse sequence taking said peak value with said instantaneous frequency while said first substantially rectangular pulse sequence continuously has said peak value if said first phase lags behind said second phase by 0° through 180°;

a low-pass filter having a prescribed high-cutoff frequency less than said predetermined frequency for producing a low-pass second output signal in response to a prescribed one of said first and said second substantially rectangular pulse sequences;

a high-pass filter having a prescribed low-cutoff frequency lower than said high-cutoff frequency for producing a high-pass output signal in response to said low-pass output signal; and

output means responsive to said high-pass output signal for producing said discriminator output signal.

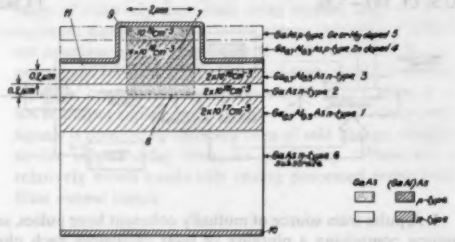
4,163,952
INJECTION LASERS

George H. B. Thompson, and David F. Lovelace, both of Harlow, England, assignors to International Standard Electric Corporation, New York, N.Y.

Continuation of Ser. No. 734,687, Oct. 22, 1976, abandoned, which is a division of Ser. No. 646,115, Jan. 2, 1976, Pat. No. 4,011,113. This application Feb. 21, 1978, Ser. No. 879,334
Claims priority, application United Kingdom, Jan. 9, 1975, 928/75
Int. Cl.[2] H01S 3/19
U.S. Cl. 331—94.5 H **3 Claims**

1. In a double heterostructure injection laser said double heterostructure comprising an active layer of high refractive index semiconductor material bounded by a first and second layer of low refractive index semiconductor material, wherein the improvement comprises:

a rib of semiconductor material formed on said second layer overlying said active region, a third layer of material disposed adjacent said rib on the surface of said second layer, said rib extending from said second layer and protruding through said third layer, said rib having a higher refractive index than the refractive index of said third layer;

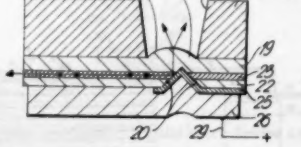


said second layer having a thickness not large compared with the wavelength of the laser radiation in said second layer, said thickness being about 0.2 micron.

4,163,953
DOUBLE HETEROSTRUCTURE LASER FOR DIRECT COUPLING TO AN OPTICAL FIBER

Anthony J. Springthorpe, Richmond, and John C. Dyment, Kanata, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Jul. 7, 1977, Ser. No. 813,678
Int. Cl.[2] H01S 3/19
U.S. Cl. 331—94.5 H **7 Claims**

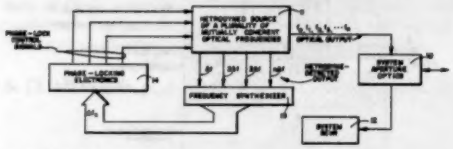


1. A laser having a semiconductor substrate and a double heterostructure on a surface of said substrate, said structure comprising; a first confining layer of semiconductor material on said surface of said substrate, an active layer of semiconductor material on said first confining layer and a second confining layer on said active layer, said first confining layer being of the same conductivity type as said substrate; said second confining layer being of the opposite conductivity type as said first confining layer and said active layer being of the same conductivity type as one of said confining layers to form a p-n junction between said active layer and one of said confining layers; a cleaved end surface on said structure, said end surface extending normal to the plane of said active layer; a reflecting surface extending through said second confining layer and said active layer and inclined relative to the plane of said active layer to form a resonant cavity between said end surface and a further surface at said substrate surface; a hole through said substrate to said first confining layer, said hole aligned with said reflecting surface for emission of light therethrough; and electrical contact means for applying a forward bias to said active layer.

4,163,954
HIGH ENERGY COHERENT PULSE SOURCE FOR LASER SYSTEM

Cecil L. Hayes, Placentia, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Continuation-in-part of Ser. No. 776,675, Mar. 11, 1977, abandoned. This application Jul. 31, 1978, Ser. No. 929,888
Int. Cl.[2] H01S *3/23, 3/10*
U.S. Cl. 332—7.51 7 Claims

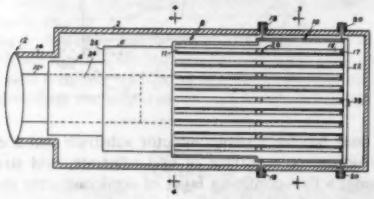


1. A pulse train source of mutually coherent laser pulses, said source comprising a plurality of laser oscillators each phase locked to a mutually exclusive one of a plurality of periodically mutually coherent frequencies, said plurality of laser oscillators comprising a reference laser oscillator of frequency f_o, and a plurality (n) of slaved laser oscillators of frequencies $(f_o+n\Delta f)$ and in which there is further provided a like number of phase-locking means as slaved oscillators, each said phase-locking means responsive to said reference oscillator and to a mutually exclusive one of said slaved oscillators for maintaining the frequency f_n and phase of said one to a frequency $(f_o+n\Delta f)$ different from and mutually coherent with that of said reference laser oscillator by an integer multiple (n) of a spacing frequency Δf which is a radio-frequency substantially less than the laser frequency of the reference oscillator.

4,163,955
CYLINDRICAL MODE POWER DIVIDER/COMBINER WITH ISOLATION

Floyd W. Iden, Pompton Plains, and George P. Scherer, Wayne, both of N.J., assignors to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Jan. 16, 1978, Ser. No. 869,725
Int. Cl.[2] H01P *5/12*
U.S. Cl. 333—127 12 Claims



1. A cylindrical mode power divider/combiner with isolation comprising:

an outer conductor having a longitudinal axis;

an impedance transformer means disposed coaxial of said axis and within said outer conductor;

an input/output coaxial transmission line coupled to said transformer means and said outer conductor;

first N-discrete, spaced transmission lines supported by a first dielectric cylinder disposed coaxial of said axis and within said outer conductor, each of said first transmission lines being coupled to said transformer means, where N is an integer greater than one;

second N-discrete, spaced transmission lines disposed coaxial of and transverse to said axis remote from said transformer means, each of said second transmission lines being coupled to a different one of said first transmission lines and terminating in a common metallic disc coaxial of and adjacent said axis;

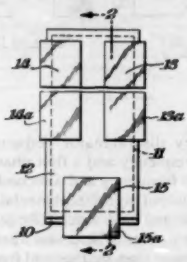
N-output/input ports each coupled to a different one of said first transmission lines adjacent said transformer means; and

N-load ports each coupled to a different one of said first transmission lines adjacent said second transmission lines.

4,163,956
WOUND MULTI-CAPACITOR FILTER

Frank E. Garlington, Williamstown, and Carl J. Famiano, Clarksburg, both of Mass., assignors to Sprague Electric Company, North Adams, Mass.

Filed Oct. 17, 1977, Ser. No. 842,780
Int. Cl.[2] H03H *7/04, 7/42;* H01G *4/32, 4/42*
U.S. Cl. 333—12 12 Claims



1. A wound multiple-capacitor filter for suppressing R.F. interference signals on power lines comprising:

(a) a floating sheet electrode;

(b) two dielectric layers being disposed over the two major faces of said floating electrode respectively;

(c) a pair of spaced sheet electrodes being disposed against said layers, each of said pair having substantially the same surface area in capacitive relationship with said floating electrode as the other, said pair of electrodes extending axially beyond the opposite edges of said floating electrode, respectively;

(d) another sheet electrode lying in contact with said layers, being spaced from said pair and having a surface area in capacitive relationship with said floating electrode that is from 0.2 to 0.001 times that of each of said pair, an outer turns portion of said floating electrode extending beyond the ends of said pair, said surface area of said another electrode having said capacitive relationship with the end region of said outer turns portion; and

(e) first, second, and third electrical access means for providing electrical access to each of said another and said pair of spaced electrodes, respectively.

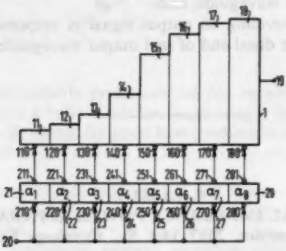
4,163,957
TRANSVERSAL FILTER WITH AT LEAST ONE ANALOGUE SHIFT REGISTER, AND PROCESS FOR THE OPERATION THEREOF

Karl Knauer, Gauting; Max Schlichte, Munich, and Hans-Joerg Pfleiderer, Zorneding, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Sep. 12, 1977, Ser. No. 832,232
Claims priority, application Fed. Rep. of Germany, Sep. 28, 1976, 2643704
Int. Cl.[2] H03H *7/28;* H01L *29/76;* H03K *5/156;* G11C *19/28*
U.S. Cl. 333—165 17 Claims

1. A transversal filter comprising analogue shift register means having successive storage positions, said shift register means having a number of parallel inputs and comprising input charge receiving storage positions having the respective parallel inputs assigned thereto, and said shift register means having

a common output, a further number of individual predeterminable evaluating circuit means each having at least one signal input for the input of the signal which is to be filtered, and at least one output, each evaluating circuit means being arranged to weight the input signal thereto in accordance with an individual evaluation factor for producing at its output a weighted charge for supply to an associated input charge receiving storage position, switching element means controlling coupling of the outputs of the evaluating circuit means with the respective assigned parallel inputs for supplying the weighted charges to respective input charge receiving storage positions via the respective assigned parallel inputs, each storage position of the shift register being at least such that it is always able to accommodate the maximum quantity of charge supplied by a preceding storage position, and each input charge receiving



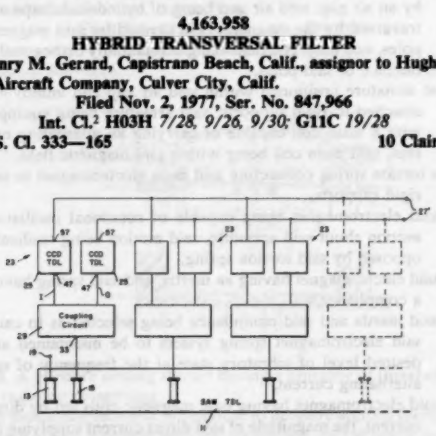
storage position being such that it is always able to accommodate the maximum quantity of charge supplied by a preceding storage position and additionally able to accommodate the maximum quantity of charge supplied via its assigned parallel input, and said filter being further characterized in that the evaluating circuit means comprises first evaluating circuits (21–24, FIG. 7) having first signal inputs thereto, and comprises second evaluating circuits (25–28, FIG. 7) having respective second signal inputs for receiving an input signal to be filtered, and in that the first signal input of every first evaluating circuit is preceded by a time delay element (800) which delays the input signal thereto relative to the input signal received by said second signal inputs by the length of time required for a quantity of charge to pass through the shift register means during the shift process.

4,163,958

HYBRID TRANSVERSAL FILTER

Henry M. Gerard, Capistrano Beach, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Nov. 2, 1977, Ser. No. 847,966
Int. Cl.[2] H03H *7/28, 9/26, 9/30;* G11C *19/28*
U.S. Cl. 333—165 **10 Claims**



1. A hybrid transversal filter, comprising:

a surface acoustic wave tapped delay line having an input signal terminal and producing at separate output terminals a plurality of respective SAW output signals in response to an input signal, each of said SAW output signals having a different and relatively long time delay;

charge coupled device means including an array of charge coupled device tapped delay lines each having an input coupled to a different one of said surface acoustic wave tapped delay line output terminals and responsive to said SAW output signals, each of said charge coupled device tapped delay lines generating at respective outputs a plurality of relatively short time delay signals; and

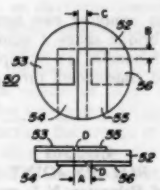
component signal coupling circuit means including a different coupling circuit responsive to each of said SAW output signals for providing at each of said coupling circuits a pair of component signals associated with a respective SAW output signal, and wherein each of said component signals is coupled by different ones of said charge coupled device tapped delay lines, for producing collectively a relatively broad bandwidth analog processed transversal filter output signal.

4,163,959

MONOLITHIC CRYSTAL FILTER DEVICE

James L. Dailing, Plantation, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 15, 1977, Ser. No. 860,918
Int. Cl.[2] H03H *9/02, 9/26, 9/32;* H01L *41/04*
U.S. Cl. 333—191 **6 Claims**



1. An improved monolithic crystal filter device comprising in combination:

a monolithic wafer body of piezoelectric material;

an essentially rectangular input electrode deposited on one side of said wafer body and an essentially rectangular output electrode deposited on the other side of said waver body in substantial alignment longitudinally with said input electrode and with a gap provided between the inboard ends of said input and output electrodes;

a pair of essentially rectangular ground electrodes, each deposited on alternate sides of said wafer body in association with a respective one of said input and output electrodes, said ground electrodes being deposited with the longitudinal axis thereof substantially perpendicular to the longitudinal axis of said input and output electrodes, said ground electrodes being positioned on said wafer body to overlie and extend beyond the extremities of an inboard end of a respective one of said input and output electrode and so that a lateral portion of each of said ground electrodes extends into said gap formed by said inboard ends of said input and output electrodes to provide a shielding effect therebetween.

4,163,960

ELECTROMECHANICAL FILTER STRUCTURE

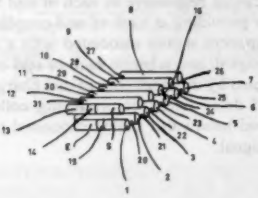
Herbert Ernyei, and Etienne Langlois, both of Paris, France, assignors to Societe Lignes Telegraphiques et Telephoniques, Paris, France

Filed Dec. 21, 1977, Ser. No. 862,906

Claims priority, application France, Dec. 30, 1976, 76 39576; Apr. 25, 1977, 77 12410

Int. Cl.[2] 333 *197;* **H03H** *9/26, 9/24, 9/04*

U.S. Cl. 333—198 **4 Claims**



1. An electromechanical band pass filter having a central frequency f_o comprising:

a plurality of cylindrical resonators $\frac{1}{4}\lambda$ long at the fundamental longitudinal vibration arranged in spaced first and second rows with their longitudinal axes parallel;

first coupling means coupling adjacent resonators in said first row;

second coupling means coupling adjacent resonators in said second row;

third coupling means coupling the last resonators at the same end of said first and second rows, said first, second and third coupling means being $\frac{1}{4}\lambda$ at the fundamental bending vibration;

an input transducer connected to that resonator in one of said rows which is at the end opposite said third coupling means;

an output transducer connected to that resonator in the other of said rows which is at the end opposite said third coupling means;

at least one bridge coupling two nonadjacent resonators such that said bridge spans a number of intercoupled resonators which number is a multiple of four; and

means biasing said transducers through one part of said resonators.

4,163,961

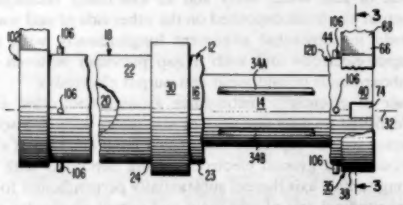
ROTARY JOINT

Oakley M. Woodward, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 13, 1978, Ser. No. 886,103

Int. Cl.[2] H01P *1/06, 1/16, 5/12*

U.S. Cl. 333—261 **9 Claims**



1. A rotary joint wherein a coupling assembly has non-contacting overlapping sleeves that are electrically coupled to each other at microwave frequencies and are relatively rotatable about an axis, comprising:

first and second outer tubular conductors;

first and second inner tubular conductors coaxially disposed within said first and second outer conductors, respectively, thereby forming input and output waveguides having respective cavities between said first and second conductors, the proximal ends of said waveguides being connected to said sleeves to provide a non-contacting electrical coupling of said waveguides through said sleeves;

mode exciter means for generating a wave at the distal end of said input waveguide in response to an input excitation signal, the electric field of said wave having a field strength that is a sinusoidal function of at least twice the angular displacement about said axis from a datum;

discontinuity means for causing said field strength to be substantially uniform at said proximal ends;

means for causing said field strength to substantially be said function of said angular displacement at the distal end of said output waveguide; and

means for providing an output signal in response to said wave at the distal end of said output waveguide.

4,163,962

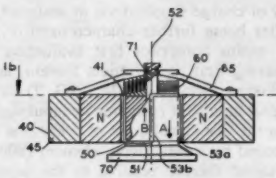
UNIVERSAL IMPEDANCE POWER APPARATUS

Nick D. Diamantides, 2517 14th St., Cuyahoga Falls, Ohio 44223

Filed Feb. 17, 1977, Ser. No. 769,311

Int. Cl.[2] H01F *7/08*

U.S. Cl. 335—222 **3 Claims**



1. A multimpeder as described comprising in combination

an electromagnet having opposite magnetic poles separated by an air gap, said air gap being of cylindrical shape and traversed by the magnetic field created by said magnetic poles, said magnetic field being substantially orthogonal to the face of said poles,

an armature positioned within said air gap and immovably attached to rigid supports, said armature being equipped with a main coil capable of carrying an alternating current, said main coil being within said magnetic field,

a torsion spring connecting said main electromagnet to said rigid supports,

said electromagnet being capable of rotational oscillatory motion about said armature, said motion being resiliently opposed by said torsion spring,

said electromagnet having an inertia, and said spring having a compliance,

said inertia and said compliance being selected as to cause said electromagnet spring system to be maintained at a desired level of vibratory state at the frequency of said alternating current,

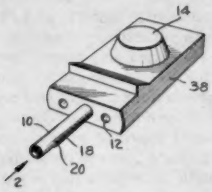
said electromagnet having base magnetic coils fed by direct current, the magnitude of said direct current supplying the bulk of said magnetic field,

said electromagnet having, additionally, control magnetic coils arranged in a manner similar to said base magnetic coils, said control magnetic coils being capable of varying said magnetic field in both intensity and polarity.

4,163,963
PROBE CONTROL

William D. Ryckman, Jr., Asheboro, N.C., assignor to General Electric Company, New York, N.Y.

Filed Sep. 8, 1977, Ser. No. 831,608
Int. Cl.[2] H01C 7/04
U.S. Cl. 338—28 7 Claims



1. A detachable probe control for an electrically heated utensil with a hollow tubular finger snugly fitting a matching recess in the utensil for good heat conduction therebetween for control of temperature of said utensil, the improvement comprising:

transducer means supported in said finger and connected to control current to the utensil for governing the heat thereto,

said transducer support including electrical insulating sleeve means between the transducer and finger,

a pair of separate complementary and electrically conductive members within and biased against said sleeve for good thermal conductivity through the sleeve,

said sleeve electrically insulating said members from each other and said finger,

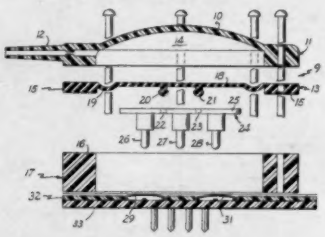
said transducer being supported between the complementary members, and

means connecting each terminal of the transducer with respective complementary members and said members with said current control for rapid response to temperature changes for accurate heat control of said utensil.

4,163,964
PNEUMATIC OR HYDRAULIC PRESSURE SENSORS WITH SEVERAL THRESHOLDS OF RESPONSE

Giangrazio De Filippis, Naples, Italy, assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 21, 1978, Ser. No. 879,317
Int. Cl.[2] H01H 35/34
U.S. Cl. 338—215 4 Claims



1. A pressure sensing device having a plurality of thresholds of response comprising

a membrane movable in response to pressure applied thereto,

an actuator movable with the membrane, said actuator having a plurality of actuating portions thereon,

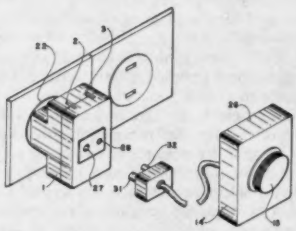
electrical contact means,

and a plurality of electromechanical control means each of which is movable with snap action to engage or disengage said electrical contact means to perform a selected control function in response to the application of predetermined force thereto and each of which resiliently resists such movement with a predetermined force, said control means normally engaging the respective actuating portions of the actuator so they cooperate in resiliently resisting movement of the membrane and actuator in response to pressure applied to the membrane but so that respective different numbers of said control means are permitted to move to perform their control functions in response to the application of selected different levels of pressure to the membrane.

4,163,965
ELECTRICAL DIMMER PLUG

Peter D. Misinchuk, 15 Ballantyne Ct., Islington, Ontario, Canada (M9A 1W8)

Continuation of Ser. No. 763,651, Jan. 28, 1977, abandoned. This application Jun. 30, 1978, Ser. No. 920,727
Int. Cl.[2] H01C 13/00
U.S. Cl. 338—220 1 Claim



1. In combination, an electrical connector device having a first housing of electrically insulative material having a plurality of spaced pairs of spaced parallel slots formed therethrough for accommodating the electrically conductive prongs of a plurality of electrical connector plugs inserted in the slots, electrically conductive terminals at all the slots in the housing for electrically contacting the prongs of electrical connector plugs inserted in the slots, and a pair of electrically conductive primary prongs extending through one of the pair of slots with parts thereof inside the housing and parts thereof outside the housing;

an additional housing;

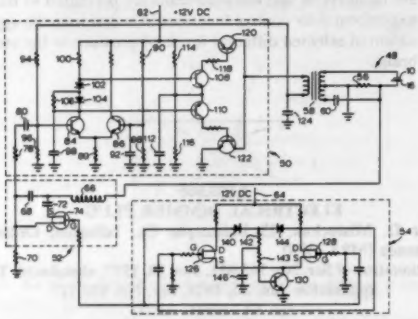
dimmer means comprising a pair of spaced parallel dimmer slots extending into the first housing, a pair of electrically conductive jackets in the dimmer slots, an independent manually variable electrical resistance unit in the additional housing and a pair of electrically conductive dimmer prongs insertable in the dimmer slots and electrically connected to the variable electrical resistance unit and extending from said additional housing, said additional housing having a manual dial outside the housing and coupled to the independent manually variable electrical resistance in the additional housing via a bore through the housing; and

circuit means having electrical conductors in the first housing electrically connecting the terminals of all the slots, the prongs and the electrically conductive jackets of the dimmer means in circuit in a manner whereby when said primary prongs are placed in electrical contact with a source of electrical energy, current supplied by the source of electrical energy is supplied to all of said terminals via said dimmer means whereby the current supplied to said terminals is manually variable via said dimmer means.

4,163,966
RODENT REPELLOR

George R. Mounce, 18 Bridle Path, Willowdale, Ontario, Canada (M2L 1C8)

Filed Apr. 4, 1978, Ser. No. 893,475
Int. Cl.[2] H04B *11/00*
U.S. Cl. 340—15 8 Claims

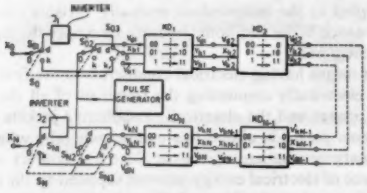


1. A vibratory device for generating sonic energy at a frequency adapted for the purpose of pest control comprising:
- a sonic resonator having a plurality of modes of vibration each at a frequency suitable for pest control;
- a driving element coupled to said resonator to vibrate said resonator to radiate sonic energy;
- an oscillatory electronic circuit including a drive amplifier, said driving element, means for providing a feedback signal to said drive amplifier which is a function of the amplitude of vibration of said resonator, a plurality of frequency-selective means, each capable of controlling the gain vs frequency response of said electronic circuit to the frequency of a different mode of vibration of said resonator and switching means for connecting said frequency-selective means one at a time into said electronic circuit;
- said driving element being in the output of said drive amplifier and said drive amplifier having a power gain sufficient to maintain the resonator in vibrating condition for pest control.

4,163,967
REVERSIBLE CODE COMPRESSOR

Jozsef Denes, and Mihaly Szokolay, both of Budapest, Hungary, assignors to Szamitastechnikai Koordinacios Intezet, Budapest, Hungary

Continuation of Ser. No. 468,548, May 9, 1974, Pat. No. 4,030,093, which is a continuation-in-part of Ser. No. 281,016, Aug. 16, 1972, abandoned. This application Jan. 14, 1977, Ser. No. 759,377
The portion of the term of this patent subsequent to Jun. 14, 1994, has been disclaimed.
Int. Cl.[2] H03K *13/00*
U.S. Cl. 340—347 DD 2 Claims

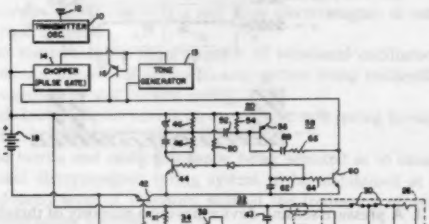


1. A system for the condensation of a binary signal sequence and for the reproduction of the condensed signal sequence comprising, in combination an input terminal for applying thereto the uncondensed signal sequence; an output terminal for applying thereto the condensed signal sequence; an input switch connected to said input terminal; an output switch connected to said output terminal; encoder means having an input connected to said input switch, said input switch being connected between said input terminal and the input of said encoder means, said encoder means having an output connected to said output switch, said output switch being connected between said output terminal and the output of said encoder means, said input and output switches connecting said encoder means to said input and output terminals when in a mode of operation for condensing said sequence; a first inverter connected between the input of said encoder means and said input terminal when in a mode of operation for reproducing the original signal sequence prior to condensing; and a second inverter connected between the output of said encoder means and said output terminal in said mode of operation for reproducing the original signal sequence prior to condensing; said input and output switches being operable in the condensing mode of operation to connect said encoder means directly between said input and output terminals, said switches connecting said encoder means in series with said first and second inverters and said output and input terminals, respectively, when in the reproduction mode of operation, said encoder means together with said inverters reproducing the original signal sequence at said input terminal from the encoded condensed signal sequence applied to said output terminal; said encoder means comprising a plurality of encoder stages connected in series, said stages performing the same transformation function; each of said encoder stages comprising shift registers shiftable both to the right and to the left and connected in series; a control circuit producing first shifting pulses for each of said shift registers synchronous with signal pulses applied to the input of the corresponding encoder stage and producing second shifting pulses between each subsequent one of said first shifting pulses for shifting said shift registers a predetermined number of times in opposite direction to that corresponding to said first shifting pulses; said control circuit comprising gating circuits checking the logical state of each of said shift registers at every shifting step and stopping said second shifting pulses at predetermined logical conditions of said shift registers.

4,163,968
SUPERVISED LOOP ALARM RADIO TRANSMITTER SYSTEM

Manfred Davis, Riverdale, N.Y., assignor to Transcience Industries, Inc., Stamford, Conn.

Filed Mar. 9, 1978, Ser. No. 884,934
Int. Cl.[2] G08B *25/00*
U.S. Cl. 340—539 10 Claims



1. An alarm radio transmitter system which comprises radio transmitter means for transmitting an alarm signal when energized,

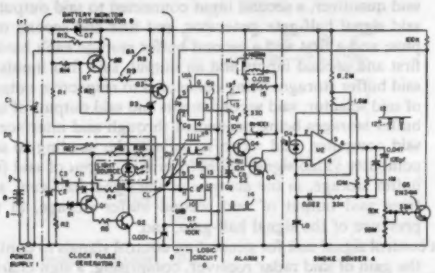
detector loop means for sensing alarm conditions,
means defining a bridge circuit including said detector loop means in at least one arm thereof for unbalancing said bridge circuit when an alarm condition is sensed, and
an electronic switch means for disconnecting operating power from said transmitter means and coupled to said bridge circuit means to energize said transmitter means only when said alarm condition is sensed.

4,163,969

VARIABLE FREQUENCY LIGHT PULSER FOR SMOKE DETECTORS

Robert B. Enemark, Duxbury, Mass., assignor to American District Telegraph Company, Jersey City, N.J.

Filed Jun. 20, 1977, Ser. No. 808,055
Int. Cl.[2] G08B *17/10*; G01N *21/26*
U.S. Cl. 340—630 **6 Claims**



1. A smoke detector comprising:
clock means periodically producing electrical pulses including means determining the clock period,
a light source connected to and operated by the clock means to produce pulsed light at the clock period,
photoelectric alarm control means actuated by smoke alteration of the pulsed light to produce an alarm signal output recurrently maintained at the period of the clock means, and
means responsive to actuation of the control means for controlling the means determining clock period.

4,163,970

PNEUMATIC SPRINGS AND OTHER TELESCOPIC SYSTEMS

Fernand M. Allinquant, 53, Avenue Le Notre, and Jacques G. Allinquant, 12, Avenue Arouet, both of 92-Sceaux, France

Division of Ser. No. 689,603, May 24, 1976, Pat. No. 4,089,512.
This application Jan. 31, 1978, Ser. No. 873,888
Claims priority, application France, May 23, 1975, 75 16138; Dec. 15, 1975, 75 38295
Int. Cl.[2] H01H *3/16*; G08B *21/00*
U.S. Cl. 340—686 **4 Claims**

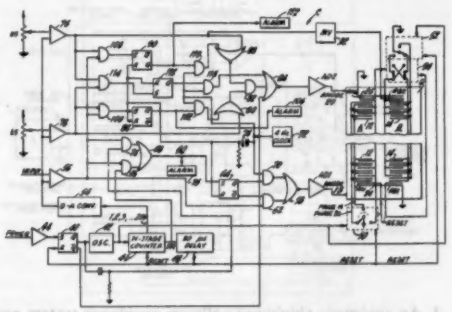
1. An extreme-position detector device for a telescopic pneumatic spring of the kind comprising a gas filled hermetic cylinder having a sealed bottom closure at one end thereof, and an assembly which is movable with respect to said cylinder and which includes a plunger rod extending gas tightly and slidably through the other end of said cylinder and into the same, and a damper piston fitted at the inner end of said plunger rod and presenting a restricted passage formed therethrough, said piston dividing said cylinder into two pressure chambers which communicate with one another through said restricted passage,
wherein the improvement comprises:
means for electrically insulating said rod-and-piston assembly and said bottom closure from each other and maintaining the same in electrical out-of-contact relationship when said plunger rod is in its extreme extended position as well as throughout substantially the whole stroke of said piston in said cylinder from said extreme extended position, a source of electric current, means for electrically connecting said rod-and-piston assembly to one terminal of said source, means for electrically connecting said bottom closure to the other terminal of said source, and an electrically actuatable signalling means fitted in series with said source in the electric circuit connecting the same to said rod-and-piston assembly and bottom closure,
whereby said signalling means is actuated to indicate upon electric contact engagement between said piston and said bottom closure occurring only when said plunger rod is in its extreme retracted position within said cylinder.

4,163,971

SYSTEMS FOR DISPLAYING ANALOG VALUES

John O. Morin, Bedford, and Joseph R. Mini, Abington, both of Mass., assignors to Sigma Instruments Inc., Braintree, Mass.

Filed May 5, 1975, Ser. No. 574,446
Int. Cl.[2] G01D *7/00*
U.S. Cl. 340—754 **54 Claims**



1. An indicator for exhibiting the analog representation of a test value and two settable limit values representing desired limits of the test value comprising:
a display and a circuit coupled to the display;
said display including an envelope containing an ionizable gas, a plurality of aligned electrodes within the envelope and forming a band, an electrode arrangement spaced from the electrodes within the envelope, and an analog device for displaying the test value;
each of said electrodes forming a gap with a portion of the arrangement, each gap forming a discharge path for a visible electric discharge of a given intensity when both the electrode at the gap and the arrangement are simultaneously subject to an enabling condition, an electrode and the arrangement both being subject to an enabling condition by application of respective potentials which produce the discharge voltage, an electrode and the arrangement both being subject to a non-enabling condition by application of potentials which produce a voltage less than the predetermined discharge voltage;
said circuit including electrode operating means coupled to said electrodes for applying an enabling condition to sequential ones of the electrodes in sequence, arrangement operating means coupled to said arrangement for applying the enabling condition to said arrangement;
said circuit including control means responsive to the two settable limit values and coupled to said electrode operat-

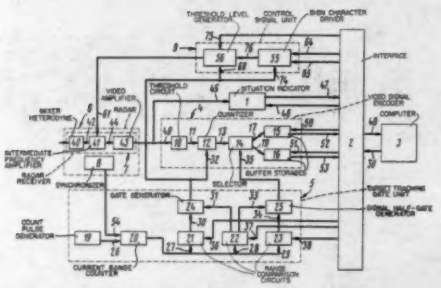
ing means and said arrangement operating means for repeatedly constraining said operating means to apply one of the conditions to sequential ones of the electrodes and the arrangement simultaneously over two sections of the band so that one section extends over a distance representing one of the values and so the one section is separated from the other section by a distance representing the difference between the two values;

said circuit including energizing means responsive to the test value for constraining said analog device to exhibit an indication of the test value adjacent the band.

4,163,972
AUTOMATIC SHIPBOARD COLLISION AVOIDANCE SYSTEM

Viktor J. Lapy, ulitsa Chekistov, 24, kv. 16; Boris P. Chernov, prospekt 40-letia Oktyabrya, 100, kv. 228; Evgeny B. Georgizon, ulitsa Fedorova, 1, kv. 10; Anatoly A. Koshevoi, Tverskoi tupik, 9, kv. 62; Gerald I. Yavorsky, ulitsa Vasilkovskaya, 2, kv. 78; Valentin I. Glaziev, ulitsa Oktyabrskoi revoljutsii, 15/5, kv. 42, all of Kiev; Boris S. Rivkin, ulitsa Kuibysheva, 3, kv. 69; Andrei A. Yakushenkov, ulitsa V. Alexeeva, 9, kv. 37, both of Leningrad, and Sergei F. Kurochkin, B. Simonovsky proezd, 11, kv. 66, Moscow, all of U.S.S.R.

Filed Jan. 6, 1978, Ser. No. 867,434
Int. Cl.[2] G01S 9/02
U.S. Cl. 343—7 A **2 Claims**



1. An automatic shipboard collision avoidance system comprising:

radar including a radar receiver having an intermediate frequency amplifier with a controllable gain, said intermediate frequency amplifier having an input receiving input signals and a control input; and a synchronizer of said radar having an output;

a situation indicator connected to said radar receiver and receiving therefrom video signals carrying data on coordinates of surface objects;

an interface;

a computer to extract target echoes from clutter, to determine coordinates and motion parameters of targets and approach parameters related to the navigator's ship, to evaluate the possibility of collision and to send data on targets being tracked to said situation indicator, said computer being connected through said interface to said situation indicator;

a target tracking gate unit generating target tracking gates using coordinates supplied by said computer and comprising: a count pulse generator having an output; a current range counter having a first input connected to said output of said counter pulse generator, a second input connected to said output of said synchronizer, and an output; a first range comparison circuit having first and second inputs and an output; a second range comparison circuit having first and second inputs and first and second outputs; a third range comparison circuit having first and second inputs and an output, said first inputs of said range comparison circuits being connected to said output of said current range counter, said second inputs of said range comparison circuits being connected to said computer through said interface; a gate generator having a first input connected to said output of said first range comparison circuit, a second input connected to said first output of said second range comparison circuit, and an output; and a signal half-gate generator having a first input connected to said output of said third range comparison circuit, a second input connected to said second output of said second range comparison circuit, and an output;

a video signal encoder converting analog video signals into computer codes and comprising: a threshold circuit having an input connected to said radar receiver, and an output; a quantizer having a first input connected to said output of said gate generator, a second input connected to said output of said threshold circuit, and an output; a selector having a first input connected to said output of said quantizer, a second input connected to said output of said signal half-gate generator, and first and second outputs; and a first and a second buffer storage each having first and second inputs and an output, said first inputs of said buffer storages being connected to respective outputs of said selector, said second inputs and said outputs of said buffer storages being connected through said interface to said computer, said video signal encoder sending to said computer video signal codes from said output of said first buffer storage, in the absence of the signal half-gate, and from said output of said second buffer storage, in the presence of the signal half-gate; and

a control signal unit for generating control signals to control the gain of said radar receiver, comprising: a sign character driver generating sign characters of count pulses and having first and second inputs connected through said interface to said computer, said sign character driver being fed with data from said computer on the presence of target echoes in the noise and signal half-gates, a third input connected to said output of said gate generator, and an output; and a threshold level generator comprising: a bidirectional counter having a counting input connected to said computer via said interface, a sign input connected to said output of said sign character driver, and an output, said bidirectional counter forming a control signal code proportional to the required gain of said intermediate frequency amplifier of said radar receiver in the target tracking gate using count pulses applied to said counting input, whose number is proportional to the required gain coefficient of said intermediate frequency amplifier of said radar receiver, and in accordance with the count pulse sign character; and a number-to-voltage converter having a first input connected to said output of said gate generator, a second input connected to said output of said bidirectional counter, said number-to-voltage converter being used to convert the code contained in said bidirectional counter into a voltage proportional to the required gain of the intermediate frequency amplifier of said radar receiver in the target tracking gate, and an output connected to said control input of said intermediate frequency amplifier.

4,163,973
MEANS FOR DEVELOPING A RADAR TRACKING ERROR SIGNAL

Robert E. Jacobson, Jr., Los Angeles, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

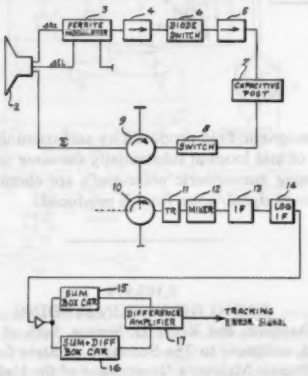
Filed Feb. 18, 1975, Ser. No. 549,402
Int. Cl.[2] G01S 9/22
U.S. Cl. 343—16 M **1 Claim**

1. In combination with a pulsed tracking radar having an antenna adapted to provide separate sum and difference received signals a circuit for deriving tracking error signals comprising

signal combining means connected to said antenna for combining received sum signal energy and difference signal energy into discrete composite error signal pulses,

a diode switch connected between said signal coupling means and said antenna having actuating characteristics that permit the input of difference signal energy to said signal combining means during approximately one-half of each error signal pulse period only,

a logarithmic detector connected to receive the output of said signal combining means,



a differential amplifier, and

first and second box car generators connected in parallel between said logarithmic detector and said differential amplifier, said first box car generator being gated to develop an output signal in response to sum signal energy only and said second box car generator being gated to develop an output signal in response to composite sum plus difference signal energy only.

4,163,974

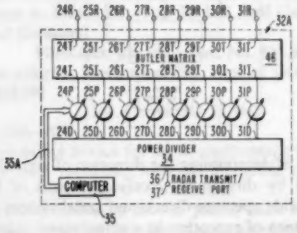
ANTENNA FEED SYSTEM

Charles E. Profera, Cherry Hill, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Oct. 14, 1977, Ser. No. 842,079

Int. Cl.[2] G01S *9/02*; H04B *7/06*; H01Q *3/24*

U.S. Cl. 343—16 M **7 Claims**



5. Apparatus adapted for providing excitation to two or more radiators of a beam forming antenna system of a radar, comprising:

power divider means having an attenuation function varying according to the value of a sinusoid whose argument varies from zero radians to π radians adapted for receiving a signal from said radar;

a plurality of phase shifters coupled to said power divider means having a linear phase shift between adjacent phase shifters;

a Butler matrix coupled to said phase shifters adapted to provide an inverse transform relationship between said phase shifters and said radiators;

whereby high sidelobes of said beam and width spreading of said beam are respectively reduced;

a paraboloid reflector; and

a platform that has a surface which carries said radiators and said reflector, said radiators being disposed along a line that intersects the focal point of said reflector at an angle with the axis thereof that causes said reflector to provide a beam of electromagnetic energy that is focused along a line transverse to a central axis of said beam when electromagnetic energy is transmitted to said reflector from one of said radiators.

4,163,975

METHOD OF MEASURING THE ALTITUDE OF A TARGET MANEUVERING AT A VERY LOW ELEVATION, AND A TRACKING RADAR USING SAME

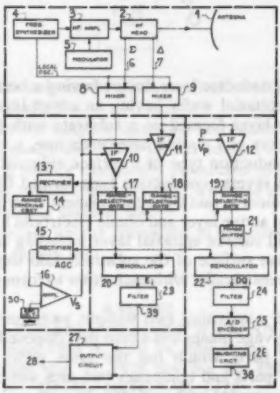
Robert Guilhem; Maurice Rivron, and Bruno Weulersse, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Jan. 3, 1978, Ser. No. 866,774

Claims priority, application France, Jan. 7, 1977, 77 00374

Int. Cl.[2] G01S *9/22*

U.S. Cl. 343—16 M **14 Claims**



7. A tracking radar of monopulse type for acertaining the altitude of a target, maneuvering at very low elevation, by processing reflected energy constituting a sum signal and a difference signal, said difference signal having an in-phase component colinear with said sum signal and a quadrature component perpendicular to said sum signal, comprising:

a first and a second channel for respectively processing said sum signal and said difference signal;

a third channel in parallel with said second channel including a $\pi/2$ phase shifter for processing the quadrature component of said difference signal;

a first demodulator with input connections to said first and second channels for deriving from the ratio of said difference and sum signals a deviation signal proportional to an angular aiming error between the direction of said target and an aiming axis of the radar at an operating frequency thereof;

a second demodulator with input connections to said first and third channels for delivering a signal voltage representing said quadrature component;

oscillator means for successively generating a multiplicity of different operating frequencies within a predetermined pass band, said channels being provided with mixer means connected to said oscillator means;

first filter means connected to said first demodulator for smoothing short-term variations of said deviation signal to provide a frequency-dependent error signal;

second filter means connected to said second demodulator for smoothing short-term variations of said signal voltage, thereby producing a resulting voltage varying with said operating frequencies;

validating means connected to said second filter means for detecting an extreme value of said resulting voltage; and

output means connected to said first filter means and to said validating means for passing said error signal upon the occurrence of said extreme value.

4,163,976

SEMICONDUCTOR LASER DEVICE

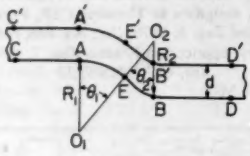
Nobuo Matsumoto, Tokorozawa, Japan, assignor to Nippon Telegraph and Telephone Public Corporation, Tokyo, Japan

Filed Jan. 5, 1978, Ser. No. 866,959

Claims priority, application Japan, Jan. 21, 1977, 52-5008

Int. Cl.[2] H01S *3/19*

U.S. Cl. 331—94.5 H **1 Claim**



1. A semiconductor laser device having a bent stripe, comprising: an epitaxial wafer having an active layer and a light confinement layer formed on a substrate with group III - V semiconductors in a double heterostructure, a stripe for converting a conduction type of a surface epitaxial layer of said wafer into a reverse conduction type formed by diffusing an impurity element in said light confinement layer to a depth not reaching said active layer and ohmic electrodes formed respectively on said surface epitaxial layer including said stripe and on the reverse surface of the substrate, said substrate having cleavage planes parallel with each other to form a resonator of the device,

said stripe comprising two straight parts perpendicular to said cleavage planes and a bent part disposed between said straight parts which has the same width as said two straight parts and comprises two arcs smoothly continuously connected with said straight parts and satisfying the conditions

$$R_1(1-\cos\theta_1)<d,$$

$$R_2(1-\cos\theta_2)<d,$$

$$R_1\sin\theta_1=R_2\sin\theta_2<L \text{ and}$$

$$\theta_1/R_1=\theta_2/R_2<0.16,$$

where d is the width of the stripe, R_1 and R_2 are radii of curvature of the arcs, θ_1 and θ_2 are anticipated angles for the arcs, and L is the distance between the cleavage planes.

4,163,977

DOUBLE LOOP RECEIVER-TRANSMITTER COMBINATION

Jürgen K. Polstorff, 702 Drake Ave., Huntsville, Ala. 35802

Filed Dec. 21, 1977, Ser. No. 862,905

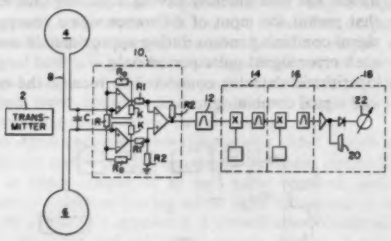
Int. Cl.[2] G01S *5/16*; H04B *5/00, 15/00*

U.S. Cl. 343—112 R **6 Claims**

1. A communication link comprising:

(a) a transmitter buried beneath the surface of the earth, said transmitter producing a magnetic field having vertical dipoles; and

(b) a receiver upon the surface of the earth for receiving the signals produced by said transmitter including an identical double loop antenna connected in a resonant circuit, said double loop antenna rotatable around a horizontal axis perpendicular to the connecting line between said loops,



said magnetic field produced by said transmitter reaching both of said loops at substantially the same time, whereby opposing atmospheric noise emf's are eliminated and an optimum signal/noise ratio is produced.

4,163,978

RADIO DIRECTION FINDING

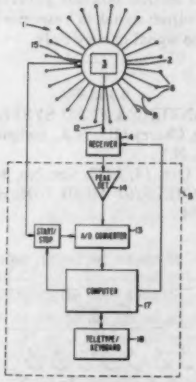
Eric G. Shepherd, and Roger D. Spragg, both of Cheltenham, England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Nov. 29, 1977, Ser. No. 855,584

Claims priority, application United Kingdom, Dec. 2, 1976, 50368/76

Int. Cl.[2] G01S *5/04*

U.S. Cl. 343—120 **25 Claims**



1. A method of determining the direction of arrival of radio wave received by directional receiving means of the kind comprising, a wide aperture directional aerial system having a directional pattern of reception in a given plane, substantially symmetrical about the direction of maximum sensitivity thereof in said plane, and a receiver coupled to the aerial system; the method comprising varying the direction of maximum sensitivity of the aerial system; detecting the amplitude of the receiver output signal during variations in said direction of maximum sensitivity of the aerial system, whereby to produce a representation of the amplitude distribution of the receiver output signal as a function of the direction of maximum sensitivity of the aerial system; and computing the point about which said amplitude distribution is most symmetrical, whereby to provide an estimate of the direction of arrival of the radio wave.

4,163,979

METHOD AND APPARATUS FOR RECORDING LATENT IMAGES ON A MAGNETIC MEDIUM IN MAGNETOGRAPHY

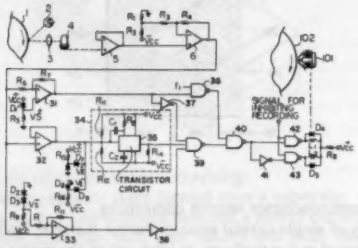
Norio Kokaji, Tokyo, Japan, assignor to Iwatsu Electric Co., Ltd., Japan

Filed Jul. 25, 1977, Ser. No. 818,453

Claims priority, application Japan, Jul. 28, 1976, 51-90006; Mar. 14, 1977, 52-27845

Int. Cl.[2] G03G *19/00*; G01D *15/12*

U.S. Cl. 346—74.1 **3 Claims**



1. An apparatus for recording magnetic latent images, utilizing magnetography, on a medium for recording, including:

means for discriminating the magnitude of the input signal,

means, responsive to said discriminating means, for generating pulses, whose frequency is of a predetermined value, when said discriminating means detects an input signal greater than a predetermined value indicative of a black color,

a voltage-to-frequency converter which produces pulses of different frequencies in accordance with the voltage of the input picture signal, whereby the value of the frequency changes in accordance with a change in the input signal corresponding to a change of color shading between black and white; and

means for applying the pulses produced by either said pulse generating means or said voltage-to-frequency converter to the recording head.

4,163,980

RECORDING ELECTRODE ASSEMBLY FOR USE IN ELECTROSTATIC REPRODUCTION

Rolf Angelbeck, Kiel; Reinhard Gesell, Schonkirchen, and Rüdiger Sommer, Raisdorf, all of Fed. Rep. of Germany, assignors to Firma Dr. -Ing. Rudolf Hell GmbH, Kiel, Fed. Rep. of Germany

Filed Oct. 26, 1977, Ser. No. 845,609

Claims priority, application Fed. Rep. of Germany, Oct. 26, 1976, 2648298

Int. Cl.[2] G03G *15/048*

U.S. Cl. 346—155 **5 Claims**

1. A recording device for use in electrostatic reproduction of an image on a recording medium including an electrode arrangement comprising in combination:

at least two insulating carrier plates, each carrying on one surface thereof a plurality of separate electrodes arranged in a row, and on the opposite surface thereof a plurality of electrical leads, said rows being substantially parallel to one another, and extending in a predetermined direction,

at least one end of each of said electrical leads being constructed as a contact tongue for plug-in connection, said electrical leads being formed as a control matrix for coincidence control of said electrodes, so that the number of said contact tongues is smaller than the number of said electrodes, said plurality of electrodes being connected to said control matrix through a corresponding one of said carrier plates,

an insulating layer disposed between said carrier plates,

a cover plate for each of said carrier plates, said carrier plates, said insulating layer and said cover plates being connected to one another,

a plurality of counter-electrodes, arranged along said predetermined direction, spaced apart from said electrodes, and defining therewith a gap adapted for the passage of the recording medium,

a support for said counter-electrodes, and

an additional carrier plate mounted on said support, said counter-electrodes being formed as conductive tracks on said additional carrier plate, each of said counter-electrodes including

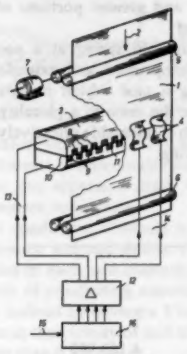
a contact surface adapted to contact said recording medium,

a strip electrically connected to said contact surface,

a supporting surface electrically connected to said strip,

an electrical supply lead connected with one end thereof to said supporting surface, and

a further contact tongue connected to the other end of said electrical supply lead.



4,163,981

SPRING TUNABLE HELICAL WHIP ANTENNA

Thomas J. Wilson, 1055 N. First Pl., Hermiston, Oreg. 97838

Filed Mar. 27, 1978, Ser. No. 890,420

Int. Cl.[2] H01Q *1/36, 1/32*

U.S. Cl. 343—715 **2 Claims**

1. A spring tunable antenna mountable on the frame of a vehicle or the like comprising,

a base mountable on the vehicle,

a flexible rod mounted at one of its ends on said base, said rod having a tip region opposite said one end, and a body region intermediate said base and said tip region,

a low-resistance conductor attached to said base and wound helically about said rod to form a plurality of helical windings encircling said rod, said windings encircling said body region having substantially fixed positions relative thereto, and said windings encircling said tip region forming a coiled spring which is adjustable selectively between compressed and extended position, wherein said spring encircles lesser and greater portions of said tip region, respectively, and

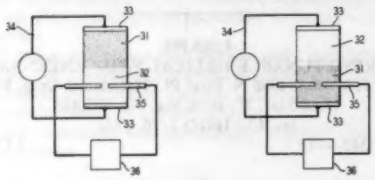
means for securing said spring at a preselected position between said compressed and extended positions, said means including a tape which is securable about said spring to encase the same in a plurality of helical wrappings, and which is releasable selectively to permit adjustment of said spring.

4,163,982

SOLID STATE ELECTRICAL SWITCH EMPLOYING ELECTROCHROMIC MATERIAL

Mauro Di Domenico, Jr., Basking Ridge; Shobha Singh, Summit, and Legrand G. Van Uitert, Morris Township, Morris County, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 29, 1977, Ser. No. 792,192
Int. Cl.[2] H01L *45/00*
U.S. Cl. 357—2 **5 Claims**



1. A solid state electrical switch which switches a load circuit on and off under the influence of a control circuit comprising

(a) an insulating base;

(b) a first control conducting electrode on top of the insulating base;

(c) an electrochromic material on top of the first conducting electrode, said electrochromic material capable of undergoing a transformation from insulator to metallic conductor on the injection of ions under the influence of an electrical field established by the control circuit;

(d) an electrolytic material on top of the electrochromic material said electrolytic material capable of injecting positive ions into the electrochromic material, said positive ions selected from the group consisting of H^+, Li^+, Na^+ and K^+;

(e) a second control conducting electrode on top of the electrolytic material which on connecting said first and second control conducting electrode to a control device becomes the control circuit;

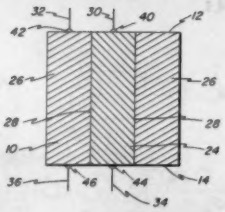
(f) two load electrodes, embedded in the electrochromic material which on electrically connecting the two load electrodes to a load device becomes the load circuit.

4,163,983

SOLID STATE NEURON

Harvey E. Cline; Thomas R. Anthony, and Ivar Giaever, all of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Sep. 28, 1978, Ser. No. 946,609
Int. Cl.[2] H01L *29/88*
U.S. Cl. 357—12 **10 Claims**



1. A semiconductor neuron comprising

a body of single crystal semiconductor material having two opposed major surfaces, at least one of the major surfaces having a preferred crystal planar orientation, a predetermined level of resistivity and a first type conductivity;

at least one first region of degenerative semiconductor material disposed in the body, extending entirely through the body and terminating in the opposed major surface of the body and having two opposed end surfaces, each end surface being coextensive with a respective one of the two major surfaces of the body;

each first region having a predetermined level of concentration of dopant impurity material and a second type conductivity;

at least one second region of degenerative semiconductor material coaxially disposed in each first region, extending entirely through the body and terminating in the opposed end surfaces of the first region and having two opposed end surfaces, each end surface of the second region being coextensive with a respective end surface of the first region;

each second region having a predetermined level of concentration of dopant impurity material and a third type conductivity which is opposite to that type conductivity of the first region;

a P-N junction formed by the abutting surfaces of each pair of first and second regions of opposite type conductivity, the P-N junction extending between and terminating in the opposed major surfaces of the body;

the predetermined level of concentration of impurity material in each pair of abutting first and second regions of degenerative semiconductor material being of a sufficient value to impart to the P-N junction formed therebetween electrical characteristics of a tunnel diode;

a first ohmic electrical contact affixed to one of the two opposed end surfaces of a first region;

a second ohmic electric contact affixed to one of the two opposed end surfaces of an abutting second region which is coextensive with the one end surface of the first region;

a third ohmic electrical contact affixed to the other of the two opposed end surfaces of the first region;

a fourth ohmic electrical contact affixed to the other of the two opposed end surfaces of the second region, and

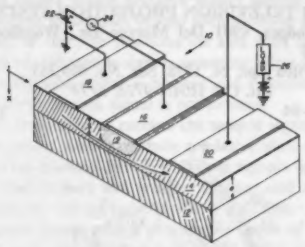
the semiconductor neuron functions in a manner similar to a biological neuron when a voltage pulse is applied across the P-N junction between the first and second electrical contacts and after a predetermined time delay the applied voltage pulse appears across the P-N junction between the third and the fourth electrical contacts.

4,163,984

FIELD EFFECT TRANSISTOR

Robert A. Pucel, Needham, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Jan. 27, 1978, Ser. No. 873,189
Int. Cl.[2] H01L *29/80*
U.S. Cl. 357—22 8 Claims



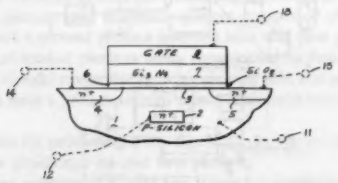
1. A field effect transistor comprising:
(a) a semiconductor layer formed over a substrate;
(b) a gate electrode disposed between a source electrode and a drain electrode, such gate, source and drain electrodes being disposed over a portion of a surface of the semiconductor layer, such gate electrode being adapted to produce a depletion zone in a portion of such semiconductor layer in response to an electrical voltage between the source and gate electrodes;
(c) such semiconductor layer having a dopant in the semiconductor layer beneath the gate electrode, such dopant having a doping concentration profile selected to linearize the relationship between the transconductance and the level of the electrical voltage fed to the gate electrode to such transistor over the operating range of such electrical voltage.

4,163,985

NONVOLATILE PUNCH THROUGH MEMORY CELL WITH BURIED N+ REGION IN CHANNEL

Fritz L. Schuermeyer, Yellow Springs, and Charles R. Young, Xenia, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Sep. 30, 1977, Ser. No. 838,437
Int. Cl.[2] H01L *29/78*
U.S. Cl. 357—23 3 Claims



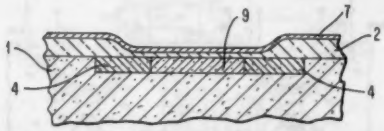
1. A five terminal nonvolatile punch through memory cell comprising:
a. a p type substrate having a surface;
b. a first and a second n+ region positioned in spaced apart relationship in the said substrate providing a source and a drain, respectively;
c. a very thin oxide layer positioned over a portion of said substrate surface in contacting relationship;
d. nitride layer positioned over the said oxide layer in contacting relationship;
e. a gate layer positioned over the said nitride layer; and
f. an n+ layer buried in the said p type substrate below the said surface of the substrate and substantially between and in spaced apart relationship to the said first and second n+ regions.

4,163,986

TWIN CHANNEL LORENTZ COUPLED DEPLETION WIDTH MODULATION EFFECT MAGNETIC FIELD SENSOR

Albert W. Vinal, Cary, N.C., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 3, 1978, Ser. No. 902,327
Int. Cl.[2] H01L *27/22, 29/82, 29/96*
U.S. Cl. 357—27 11 Claims



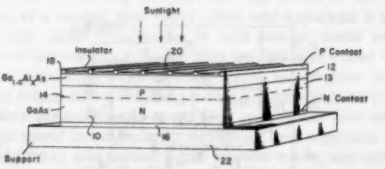
1. In a semiconductive, channel conduction, field sensor device having a substrate of semiconductive material, a source region and at least two separated drain regions in said substrate, the improvement comprising:
at least two first conductive channels in said substrate connecting said source and said drains, there being one said drain connected to each said channel;
said first channels of conducting material each have a filamentary form defined by having a Vinhall width to channel width ratio in the vicinity of said source that is greater than 0 and less than 0.98; and
a Lorentz voltage generating conductive channel in said substrate between said two first conductive channels and electrically coupling said two first channels together for applying a Lorentz voltage thereto in a direction at right angles to the flow of carriers in said two first channels.

4,163,987

GAAS-GAALAS SOLAR CELLS

G. Sanjiv Kamath, Malibu, and Carl L. Anderson, Pacific Palisades, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed May 2, 1977, Ser. No. 792,839
Int. Cl.[2] H01L *27/14*
U.S. Cl. 357—30 2 Claims



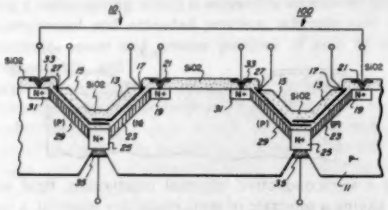
1. A solar cell structure comprising in combination:
(a) an N-type gallium arsenide substrate,
(b) a P-type gallium aluminum arsenide epitaxial layer on said substrate,
(c) a P-type region of gallium arsenide within said substrate and beneath said epitaxial layer and defining a PN junction in said substrate, said epitaxial layer grown from a solution having beryllium therein at a concentration level sufficient to establish a beryllium-to-gallium ratio in said growth solution on the order of about 1:100,000 by weight to thereby minimize the resistivity on each side of said PN junction to a value which is substantially independent of the aluminum concentration in said P-type gallium aluminum arsenide epitaxial layer, and
(d) electrical contact means on both said substrate and said epitaxial layer, respectively, for conducting current from said solar cell at power conversion efficiencies in excess of 16%.

4,163,988

SPLIT GATE V GROOVE FET

Keming W. Yeh, Westchester, and James L. Reuter, Rancho Palos Verdes, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Jan. 30, 1978, Ser. No. 873,333
Int. Cl.[2] H01L 29/06
U.S. Cl. 357—55 **21 Claims**



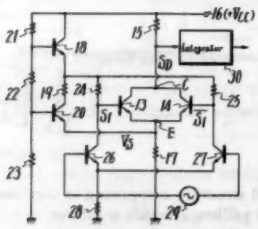
1. A split gate V groove FET device mounted in a substrate with a first terminal comprising a body of a first conductive material in the apex of said V groove, said first terminal connected to a first conductive channel in a first side of said V groove to form a first transistor and said first terminal connected to a second conductive channel in a second side of said V groove to form a second transistor, said V groove is mounted in a substrate of a body of conductive material of a second type, said first and second channels being connected to respective second and third terminals of conductive material of said first type and at ends opposite from the apex of said V groove.

4,163,989

DETECTOR CIRCUIT FOR COLOR TELEVISION RECEIVERS

Susumu Akazawa, Ichikawa; Kyoichi Murakami, Chigasaki; Kiyoshi Ishihata, Fujisawa, and Takao Tsuchiya, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed May 4, 1978, Ser. No. 903,003
Claims priority, application Japan, May 17, 1977, 52-63109[U]
Int. Cl.[2] H04N 9/535; H03D 1/02
U.S. Cl. 358—27 **6 Claims**



1. A detector circuit for a color television receiver, comprising

a pair of transistors each having first and second currentcarrying electrodes and a control electrode, and circuits defined by the first and second current-carrying electrodes of said transistors and being connected in parallel with each other;

circuit means receiving an input signal for supplying a corresponding differential input signal to each of the control electrodes of said pair of transistors;

reference voltage means supplying a reference voltage to the second current-carrying electrodes of said pair of transistors;

a source of a supply voltage;

an impedance element coupled between the first current-carrying electrodes of said pair of transistors and supply voltage source; and

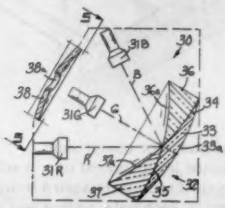
integrating means for integrating a detected signal from the first current-carrying electrodes of said pair of transistors and thereby providing an output signal.

4,163,990

COLOR TELEVISION PROJECTION SYSTEM

Marvin P. Hodges, 4801 Del Moreno Dr., Woodland Hills, Calif. 91364

Filed Apr. 24, 1978, Ser. No. 899,361
Int. Cl.[2] H04N 9/16, 5/74
U.S. Cl. 358—64 **12 Claims**



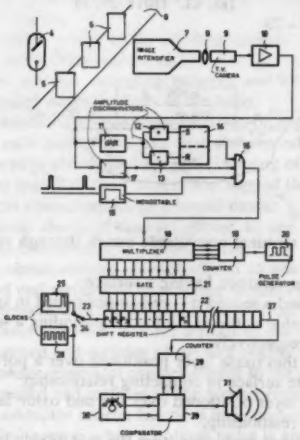
1. A system for projecting a color television image comprising a plurality (n) of cathode ray tubes of different monochromatic colors, each tube having an image display screen, an optic having a plurality of successive reflective surfaces equal in number to the number of tubes, said reflective surfaces being selectively reflective to at least n—1 colors, said tubes and said surfaces positioned such that each surface reflects an image appearing on the screen of one tube, and a lens disposed behind said tubes to transmit a composite color image of the images reflected from said surface.

4,163,991

ARRANGEMENT FOR EXAMINING OBJECTS

Thomas Burrig, Hamburg, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 8, 1978, Ser. No. 903,546
Claims priority, application Fed. Rep. of Germany, May 10, 1977, 2720865
Int. Cl.[2] H04N 7/18
U.S. Cl. 358—111 **5 Claims**



1. A device for examining objects for regions whose emission, absorption or reflection deviates from that of the surrounding regions, comprising:

scanning means which scan the object, line-by-line, and supply a scanning signal depending on the emission, absorption or reflection;

means for generating a binary identification signal when a region whose emission, absorption or reflection considerably deviates from that of the surrounding regions is scanned;

coding means which produce binary sample signals corresponding to samples of said identification signal at a plurality of discrete positions on said scan lines, the logic level of said sample signals assuming a first value when the identification signal is present and a second value when the identification signal is not present;

a store connected to receive the sample signals;

a gate means which produce a relative shift of at least one discrete position between sample signals associated with successive lines and which combine said shifted sample signals by ORing logic levels of said first value; and

evaluation means which process the result of said combination and which activate a signal upon the occurrence therein of several consecutive logic levels associated with the identification signal.

4,163,992

DIGITAL VIDEO EFFECTS SYSTEM EMPLOYING A CHROMA-KEY TRACKING TECHNIQUE

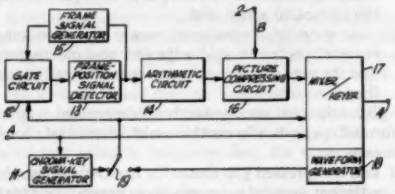
Masao Inaba, and Kazuo Kashigi, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Aug. 15, 1978, Ser. No. 933,815

Claims priority, application Japan, Aug. 17, 1977, 52-98938

Int. Cl.² H04N 5/22

U.S. Cl. 358—183 **5 Claims**



1. A tracking system for producing special effects on a television picture said television picture comprised of a first picture and a second picture inserted into said first picture, said first and second pictures being represented by first and second video signals, respectively, wherein said first and second video signals have a predetermined aspect ratio, said system comprising:

means for producing a key signal representing a key frame to be positioned on said first picture;

means responsive to said key signal for producing a position signal representing a position of a circumscribed frame of said key frame;

means responsive to said position signal for producing an imaginary-frame position signal, said imaginary-frame position signal representing an imaginary frame and said imaginary frame having said predetermined aspect ratio;

means responsive to said second video signal and said imaginary-frame position signal for producing a compressed second video signal representing a compressed second picture, said compressed second picture being identical in size to said imaginary frame; and

means responsive to said key signal for selectively combining said first video signal and said compressed second video signal, whereby said special effects are produced.

4,163,993

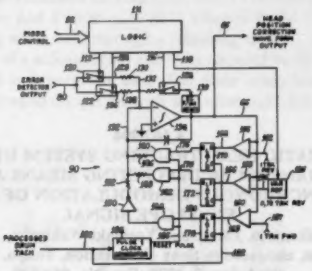
CONTINUOUS SLOW MOTION AUTOMATIC TRACKING SYSTEM

Raymond F. Ravizza, Cupertino, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Mar. 23, 1978, Ser. No. 889,451

Int. Cl.² H04N 5/78; G11B 21/10, 15/18

U.S. Cl. 360—10 **26 Claims**



1. Apparatus for providing generally continuous and noise free transfers of signal information with respect to a magnetic tape during transitions between operating modes, including the transition from a first mode wherein the tape is transported slower than normal speed and a second mode wherein the tape is transported at the normal speed in a rotary scan magnetic tape recording and/or reproducing apparatus of the type which has transducing means operatively supported by rotation means for scanning a magnetic tape along a plurality of adjacent discrete tracks oriented at an angle relative to the lengthwise direction of the tape, the rotation means including movable means carrying the transducing means and effecting movement of the transducing means in opposite directions relative to a nominal position along a path generally transverse to the direction of said tracks in response to signals being applied thereto, said apparatus comprising:

means for generating first positioning signals and applying same to said movable means to have said transducing means accurately follow a subject track;

means for moving the tape past the transducing means;

means for controlling said tape moving means to move the tape at a normal tape speed when said apparatus is transferring signal information in said second mode and to move the tape at a slower than normal tape speed when said apparatus is transferring signal information in said first mode, said controlling means accelerating said tape to a first predetermined speed that approaches said normal tape speed in response to switching said apparatus from said first to said second signal transfer mode, said controlling means accelerating said tape to said normal tape speed in response to relatively synchronizing the tape moving means and the rotation means for signal transfers at the normal tape speed;

means for applying second positioning signals to said movable means following the end of a scan of a track by the transducing means to position the movable means so that the transducing means scans the next desired track, said second positioning signals being effective to move said transducing means one or more predetermined distances in either direction relative to a nominal position;

means for determining whether second positioning signals are to be applied to said movable means by said second positioning signal applying means, said determining means including means for generating decision levels indicative of the requirement for the application of second positioning signals that change in relation to the mode of operation of said apparatus and means for monitoring a signal that is proportional to the position of said movable means relative to said nominal portion for effecting the application of

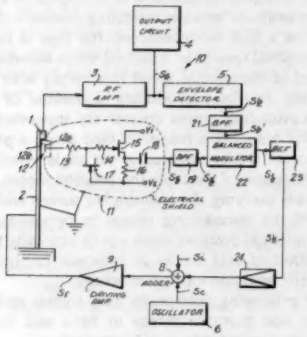
second positioning signals in accordance with the monitored signal and generated decision levels.

4,163,994

AUTOMATIC HEAD TRACKING SYSTEM UTILIZING TRANSDUCER DEFLECTING MEANS AND SYNCHRONOUS DEMODULATION OF THE ENVELOPE SIGNAL

Hitoshi Sakamoto, Zama, and Yoshiaki Wakisaka, Atsugi, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jun. 2, 1978, Ser. No. 911,833
Claims priority, application Japan, Jun. 4, 1977, 52-72050[U]
Int. Cl.[2] H04N *5/78*; G11B *21/04, 21/10*
U.S. Cl. 360—70 **11 Claims**



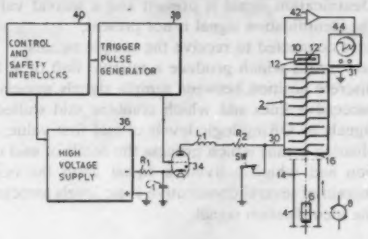
1. An apparatus for reproducing information signals recorded in a track on a record medium; comprising a transducer movable along said track for reproducing the information signal recorded therein; transducer deflecting means mounting said transducer and being operative in response to the reception of an electrical drive signal for deflecting said transducer in a direction which is transverse in respect to the direction along said track; deflection responsive signal generating means for generating a deflection responsive signal in correspondence to the deflection of said transducer in said transverse direction from a rest position; and control circuit means including oscillating means for providing a dither oscillation signal to said transducer deflection means which causes said transducer to oscillate in said transverse direction about a null position, envelope detecting means for detecting the envelope of the output of said transducer as the latter moves along the track and oscillates in said transverse direction, means connected with said envelope detecting means and said deflection responsive signal generating means for synchronously demodulating the detected envelope from said envelope detecting means by means of said deflection responsive signal so as to obtain a tracking error signal representative of the deviation of said null position of the transducer from the center of the track considered in said transverse direction, and means for adding said tracking error signal to said dither oscillation signal so as to provide therefrom said electrical drive signal for said transducer deflecting means and by which said null position of the transducer is aligned with said center of the track.

4,163,995

APPARATUS AND METHOD FOR DETECTING NON-ALIGNMENT OF A MAGNETIC HEAD WITH RESPECT TO A RECORDING TRACK ON A RECORD MEDIUM

William R. Nayland, Ripley, England, assignor to Burroughs Corporation, Detroit, Mich.

Continuation of Ser. No. 792,294, Apr. 29, 1977, abandoned.
This application Sep. 27, 1978, Ser. No. 946,297
Int. Cl.[2] G11B *5/20*
U.S. Cl. 360—76 **1 Claim**



1. In a system for detecting lateral offset and skew misalignment of a gap-type magnetic head with respect to the center line of a recording track on a record medium, a test pattern generating member for writing a distinctive magnetic image on the record medium, said test pattern generating member comprising:

A. continuous sinusoidal conductor means, having an elongated rectangular shape, having a plurality of adjacent first and second transverse sinusoid segments, having a longitudinally-extending center line, and having longitudinal edges,

1. said sinusoidal conductor means for carrying a flux-inducing electrical current pulse through the length of the sinusoidal array, and

2. said sinusoidal conductor means for producing flux reversals between said adjacent sinusoid segments so that the recorded image contains periodically-occurring flux reversals;

B. discontinuous nonconductive compressed gap means, formed periodically within said sinusoidal conductor means,

1. said compressed gap means for narrowly separating said adjacent sinusoid segments, so as to produce a high-density flux concentration between said segments when an electrical current pulse is passed through said sinusoidal conductor means, so that as a magnetic head reads the resulting recorded image on a record medium, a single, sharply-defined pulse is generated each time the head moves across from the flux pattern produced by one sinusoid segment to the pattern produced by the next adjacent segment,

2. said compressed gap means having first and second center-straddling portions on opposite sides of said conductor means centerline, said first portions extending to said longitudinal edges of said sinusoidal conductor means and said second portions terminating short of said longitudinal edges;

C. said discontinuous nonconductive compressed gap means further having gap angle means connecting said first and second portions and traversing said conductor means centerline,

said gap angle means for mutually and longitudinally displacing said center-straddling first and second gap portions,

so that the sharply-defined unitary pulses, produced when a magnetic head reads the recorded images generated by said displaced first and second gap portions, are distinguishably separated in a manner which enables a comparison to be made of both the amplitudes of adja-

cent common-polarity pulses as well as the periods between adjacent opposite-polarity pulse groups, so as to indicate lateral offset and skew misalignment of the magnetic head with respect to the recorded image centerline corresponding to the centerline of said sinusoidal conductor means; and

D. nonconductive substrate means,

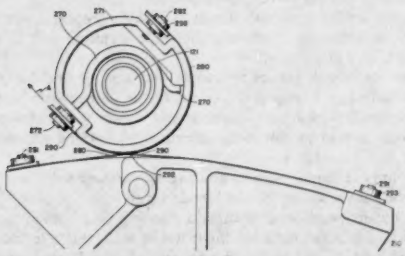
for supporting said sinusoidal conductor means.

4,163,996

RIGID MAGNETIC DISC MEMORY APPARATUS EMPLOYING STEPPER MOTOR DRIVE AND PIVOTABLE HEAD SUPPORT WITH TEMPERATURE COMPENSATION

Robert G. Kaseta, Stow; Lenn Daugherty, Northboro; Sigmund Hinlein; Michael Feldstein, both of Sudbury; Harold Thackaberry, Franklin, and Robert E. Barrows, Hopedale, all of Mass., assignors to Data General Corporation, Westboro, Mass.

Filed Apr. 24, 1978, Ser. No. 899,047
Int. Cl.[2] G11B *5/54, 17/00, 5/48*
U.S. Cl. 360—97 **4 Claims**



1. In memory apparatus including at least one spinable and non-flexible magnetic disc, said apparatus supported by a base and intended for use in a digital computer system, rotary means for accurately positioning magnetic heads relative to tracks on at least one surface of said disc, said rotary means comprising:

pivotable means pivotably mounted on said base with pivot axis of said pivotable means substantially parallel to spin axis of said spinable magnetic disc, for supporting said magnetic heads;

stepper motor means, including a rotational stepper motor mounted on said base with rotation axis of the shaft of said rotational stepper motor substantially parallel to said spin axis, for receiving electrical signals from said computer system and for step-rotating said shaft in response to said signals;

taut-biased and flexible band means substantially inelastic in the taut-biased directions for coupling rotational motion of said shaft to said pivotable means in a manner to cause hysteresis-free motion of said pivotable means about said pivotable axis whereby said magnetic heads are positioned along said disc surface;

said pivotable means, said band means, and said magnetic disc together including temperature compensation means for minimizing displacement of said heads relative to said tracks when ambient temperature changes.

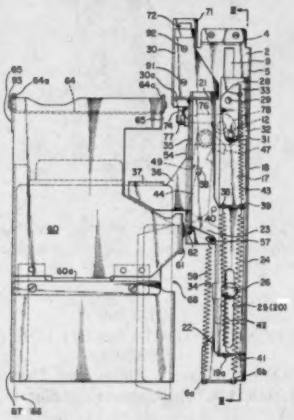
4,163,997

CASSETTE ACCEPTING AND EJECTING DEVICE

Masanori Sugihara, Tokyo, Japan, assignor to Beltek Corporation, Japan

Filed Mar. 17, 1978, Ser. No. 887,529
Claims priority, application Japan, Mar. 18, 1977, 52/30081
Int. Cl.[2] G11B *15/24, 15/66*
U.S. Cl. 360—137 **6 Claims**

1. A cassette loading and unloading device comprising: a container (67) adapted to hold a cassette; a movable plate (23) adapted to be moved loading a spring (41) as said cassette is inserted; a container driving plate (50) engaging said container and adapted to move said container to a playing position by the force of a spring (59); a locking plate (44) pivotally mounted adjacent said container driving plate, said movable plate and said container driving plate being adapted to be selectively retained by a pivoting of said locking plate, one of said movable plate and container driving plate being released from said locking plate; and a slide plate (17) adapted to be prevented from moving when held through a retaining member (28) upon energization of a solenoid (69) and to be allowed to move when said solenoid is denergized, said slide plate being biased by a spring (42) so as to cooperate with said container driving plate



when moved forwardly and with said movable plate when moved backwardly, said locking plate being pivotally supported for free rocking movement, and provided at its one end with a projection (47) and a notch (48) leading from said projection and at the other end with a notch (49), said notch (49) being adapted to stably arrest and hold a pin 58 of said container driving plate biased by said spring (59), said projection (47) being adapted to be pressed by a pin (40) provided on said movable plate when said movable plate is moved as a result of the insertion of the cassette, said locking plate (44) being adapted to be further rotated when the cassette is released from the insertion force, so as to release said container driving plate and so as to hold said movable plate.

4,163,998

LAMPSHADE HAVING PICTURE DISPLAY WINDOW

Robert L. Anderson, and Jeannette M. Anderson, both of P.O. Box No. 209, Chesterstown, Md. 21620

Filed Dec. 16, 1977, Ser. No. 861,427
Int. Cl.[2] T21V *1/04*
U.S. Cl. 362—358 **8 Claims**

1. A lampshade assembly having a window opening formed therein, an inner at least partially transparent sheet located within said lampshade at said opening, said sheet being secured to said lampshade along only an upper marginal portion of said sheet and forming a carrier for a picture to be displayed through the window opening, a lower marginal portion of said inner sheet being separable from said lampshade to receive the picture to be displayed, and a semi-rigid wire, picture retaining member having a configuration conforming to a horizontal cross section of the lampshade; said retaining member being removably located within said lampshade and biased radially

outwardly into contact with the inner surface of the lower, marginal portion of said inner sheet to maintain said inner sheet

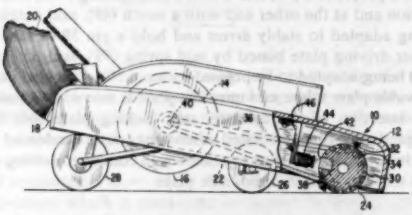
in contact with said lampshade and thereby retain the picture in position for display through said window opening.

4,163,999

ELECTRONIC CUTOUT CIRCUIT FOR VACUUM CLEANERS

Bradley C. Eaton, Pompton Plains, and Thomas M. Taylor, Flanders, both of N.J., assignors to The Singer Company, New York, N.Y.

Filed Jan. 9, 1978, Ser. No. 867,998
Int. Cl.[2] H02H 7/08
U.S. Cl. 361—23 **3 Claims**



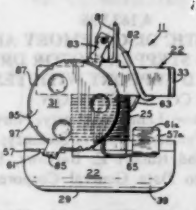
1. In a vacuum cleaner having a chassis, an electric motor mounted in the chassis, means for connecting said cleaner to a source of electric power including switch means in circuit with the motor, said switch means being selectively manually operable to a first position for denying electric power to said motor and to a second position for supplying electric power to said motor, an aperture formed in the chassis providing an air inlet, means driven by the motor for drawing dirt laden air into the inlet, a brush roller assembly rotatably mounted in the chassis and extending through the inlet, and means including a belt for rotatably driving the brush roller assembly from the motor, the improvement comprising sensing means responsive to rotation of the brush roller assembly below a predetermined speed when the motor is supplied with electric power for providing an output signal at a predetermined level, control means coupled to receive the output signal and responsive to the predetermined level of the output signal for removing power from said motor, and means responsive to the supplying of power to the motor by the switch means for delaying operation to the sensing means for a sufficient period to allow the motor to initially come up to speed.

4,164,000

RELAY-STARTER ELECTRICAL DEVICE FOR A PRIME MOVER

Lee O. Woods, Morrison, Ill., assignor to General Electric Company, Fort Wayne, Ind.

Filed Aug. 31, 1977, Ser. No. 829,276
Int. Cl.[2] H02H 7/08
U.S. Cl. 361—27 **27 Claims**



1. An electrical device adapted to be removably mounted in plug-on circuit relation with a pair of male terminals of an electrically energized apparatus, the electrical device comprising:

a housing having a receptacle portion;

a pair of female terminals disposed in said receptacle portion and adapted for receiving the male terminal pair in the plug-on circuit relation;

a pair of switch means terminals disposed in said housing including a first pair of contacts on said switch means terminals within said housing, and a pair of exterior portions on said switch means terminals extending exteriorly of said housing, respectively;

a dummy terminal on said housing and connected in circuit relation with one of said female terminals;

coil means associated with said housing and connected in circuit relation between the other of said female terminals and one of said exterior portions of one of said switch means terminals;

switch means in said housing including means movable for bridging between said switch means terminals, a second pair of contacts on said bridging means for circuit making engagement with and breaking disengagement from said first contact pair, respectively, and armature means disposed in said housing in magnetic coupling relation with said coil means and operatively associated with said bridging means, said armature means being magnetically operable generally upon the energization of the coil means for moving said bridging means between positions respectively engaging and disengaging said second contact pair and said first contact pair;

a casing disposed at least closely adjacent said housing and including at least a base wall and a sidewall interconnected with said base wall, a generally open-ended recess in said casing between said sidewall and said base wall, and an aperture in said casing extending through at least said sidewall;

a PTCR disposed in said recess and having a pair of opposite contact sides;

a first contact plate disposed in said recess adjacent said base wall so as to be in electrical contacting engagement with one of said opposite contact sides of said PTCR, said first contact plate including a first integral terminal extending therefrom through said aperture exteriorly of said casing with said first integral terminal being mounted to one of said dummy terminal and the other of said exterior portions of the other of said switch means terminals in circuit relation therewith;

a second contact plate arranged with said casing exteriorly thereof so as to close at least in part said recess and so as to be in electrical contacting engagement with the other of said opposite contact sides of said PTCR, said second contact plate including a second integral terminal exteriorly of said casing and mounted to the other of said

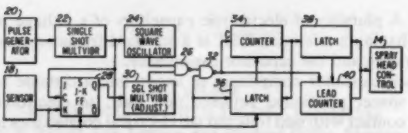
dummy terminal and said other exterior portion of said other switch means terminal in circuit relation therewith, and a plurality of means integral with said second contact plate and extending therefrom exteriorly of said casing across said sidewall into releasable securing engagement with said base wall for maintaining said second contact plate generally against displacement from said casing; and means associated with said first contact plate and said base wall for resiliently urging said first contact plate toward its electrical contacting engagement with said one opposite contact side of said PTCR and said other opposite contact side of said PTCR toward the electrical contacting engagement thereof with said second contact plate.

4,164,001

SPEED COMPENSATING CONTROL SYSTEM

Edmond J. Patnaude, 1240 Lorraine Rd., Apt. 3D, Wheaton, Ill. 60187

Filed Apr. 4, 1978, Ser. No. 893,211
Int. Cl.[2] H01H *47/00*
U.S. Cl. 361—236 **5 Claims**



1. A system for providing control signals in response to the movement of articles past a sensor, comprising

pulse generating means for producing a train of constant width pulses, each pulse being produced in response to a predetermined incremental movement of said articles,

oscillator means for producing a predetermined number of high frequency pulses during each constant width pulse

sensor means for sensing each of said articles and for producing an initiating signal in response thereto,

counter means for producing a control signal when a predetermined number of pulses have been applied thereto following the occurrence of said initiating signal, and

means for coupling said high frequency pulses to said counter means only during the occurrence of said constant width pulses for a predetermined period after the occurrence of said initiating signal and for thereafter coupling said constant width pulses to said counter means,

whereby the distance through which said articles move between the time they are sensed and the production of the corresponding control signals is proportional to the velocity of said articles.

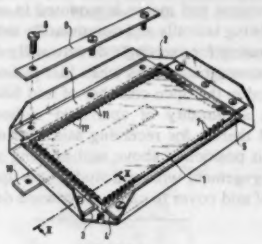
4,164,002

CONNECTION ASSEMBLY FOR INTERCONNECTING A CIRCUIT BOARD AND A FRAME

Jacques Francois, Vincennes, and Georges Guillaumot, Antony, both of France, assignors to Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

Filed Dec. 21, 1977, Ser. No. 862,805
Claims priority, application France, Dec. 28, 1976, 76 39283
Int. Cl.[2] H05K *1/04*
U.S. Cl. 361—399 **9 Claims**

1. A connection assembly for connecting an electric circuit support board to a surrounding frame, said frame being formed by a plate provided with an inner cut-out for accommodating said board without said board contacting the inside edges of said frame, said connection assembly comprising a plurality of electrically conductive combs, said combs each having teeth disposed between an inside edge of the frame and the facing edge of the board, said frame and board edges and said teeth being coplanar, the teeth of each comb being inclined to the edges of the frame and the board in contact therewith, the spine of each comb being disposed along an inside margin of the frame, means for fixing the spine of each comb along an



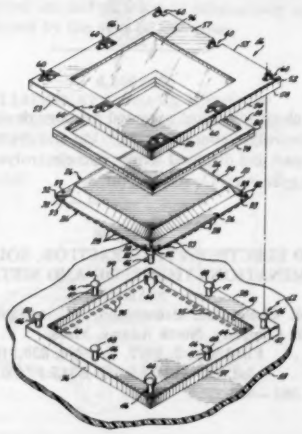
inside margin of said frame, and the ends of the teeth being soldered to the periphery of the board.

4,164,003

INTEGRATED CIRCUIT PACKAGE AND CONNECTOR THEREFOR

John M. Cutchaw, 7333 E. Virginia, Scottsdale, Ariz. 85257

Continuation-in-part of Ser. No. 754,365, Dec. 27, 1976, Pat. No. 4,063,791. This application Dec. 20, 1977, Ser. No. 862,582
Int. Cl.[2] H05K *1/04*
U.S. Cl. 361—403 **8 Claims**



1. A connector for removably mounting an integrated circuit package having laterally extending conductive leads on a backpanel and electrically coupling the conductive leads thereof to the terminal pads provided on the backpanel, said connector comprising:

(a) a housing for mounting on the backpanel, said housing having endless upstanding side walls which form the perimeter of an open chamber into which the integrated circuit package is nestingly positionable with the conductive leads thereof in aligned engagement with the terminal pads of the backpanel;

(b) pressure pads means mountable in the open chamber of said housing so as to rest on the conductive leads of the circuit package when that package is positioned in said housing, said pressure pad disposed to extend above the side walls of said housing;

(c) a plurality of stud means mounted on said housing in substantially evenly spaced increments so as to be upstanding from the side walls thereof in an array which surrounds the open chamber of said housing; and

(d) a cover positionable above said housing in overlaying

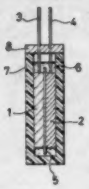
relationship with respect to the sidewalls thereof and in engagement with that portion of said pressure pad means which extends above the side walls of said housing when said pressure pad means is mounted in said housing, said cover being laterally and downwardly movable relative to said housing for exerting a downwardly directed force on said pressure pad means when that pressure pad means is mounted in the open chamber of said housing, said cover having a plurality of apertured inclined plane means formed therein for receiving said stud means when said cover is positioned above said housing and which move into engagement with said stud means upon lateral movement of said cover to cause downward deflection thereof.

4,164,004

ELECTROCHEMICAL POTENTIAL MEMORY DEVICE USING LIQUID ELECTROLYTE

Satoshi Saito, Kyoto, Japan, assignor to Japan Storage Battery Company Limited, Kyoto, Japan

Filed Jul. 1, 1977, Ser. No. 812,302
Int. Cl.[2] H01G *9/00*
U.S. Cl. 361—433 **16 Claims**



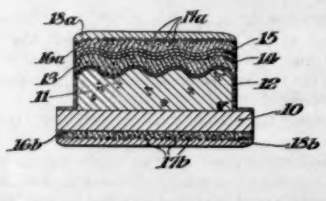
1. An electrochemical potential memory device comprising (a) an electrolyte containing Ag^+ ion and (b) two electrodes spaced apart and disposed within said electrolyte and containing an Ag_2Se-Ag_3PO_4 solid solution.

4,164,005

SOLID ELECTROLYTE CAPACITOR, SOLDERABLE TERMINATIONS THEREFOR AND METHOD FOR MAKING

David M. Cheseldine, Bennington, Vt., assignor to Sprague Electric Company, North Adams, Mass.

Filed Sep. 2, 1977, Ser. No. 830,310
Int. Cl.[2] H01G *9/00*; B01J *17/00*
U.S. Cl. 361—433 **27 Claims**



12. In a solid electrolyte capacitor of the kind having a porous valve metal pad sinter-bonded to one surface of a substrate, which surface is of said valve metal, and including an oxide film grown over said valve metal, a solid electrolyte layer overlying said film, and a layer of graphite covering said solid electrolyte at a region thereof that overlies the surface of said pad remotest from said substrate, the improvement comprising: a conductive resin layer that is rendered conductive by having a matrix of conductive particles dispersed therein, said resin layer overlying said graphite layer; and a layer consisting of distinct solderable particles which is directly bound by and only partially embedded in the outer surface of said conductive resin layer.

4,164,006

CAPACITORS WITH MINIMUM ESR

James J. Kolkowski, Adams, Mass., assignor to Sprague Electric Company, North Adams, Mass.

Division of Ser. No. 752,585, Dec. 20, 1976, Pat. No. 4,107,834.
This application Mar. 13, 1978, Ser. No. 886,189
Int. Cl.[2] H01G *9/00*
U.S. Cl. 361—433 **2 Claims**

1. A plurality of electrolytic capacitors of a voltage rating and having a minimum ESR at a standard frequency and for the rating and the capacitor capacitance,

each capacitor comprising an anode foil, a cathode foil, a spacer positioned between said foils, an electrolyte in contact with said foils and tab electrical connections to the foils,

the foils, electrolyte, spacer and tabs being assembled into capacitor bodies and encased in an enclosure,

the foils, spacer, tabs and electrolyte of each capacitor body being so constructed and arranged that the respective capacitance of each capacitor is related to a respective foil width and each capacitor having capacitance in accordance with the foil width, and the foil length for said plurality of capacitors is constant,

whereby a correlated plurality of capacitors are formed in which plurality there are at least two capacitors having different capacitances, and being of a uniform voltage rating, all of which plurality of capacitors are related to each other in having a constant foil length and a minimum ESR at said standard frequency so that each capacitor is capable of operation at said standard frequency at an ESR which is not appreciably in excess of its lowest ESR at said standard frequency.

4,164,007

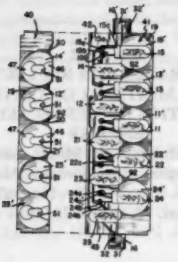
MULTILAMP PHOTOFLASH UNIT

Emery G. Audesse, Beverly, Mass., and Donald W. Hartman, Williamsport, Pa., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Oct. 7, 1977, Ser. No. 840,497
Int. Cl.[2] G03B *15/02*
U.S. Cl. 362—13 **8 Claims**

1. A multilamp photoflash unit of elongated shape comprising in combination: circuit means for connecting firing pulses to the lamps of said unit; two parallel columns of horizontally disposed tubular photoflash lamps arranged in a planar array and having respective bases from which lead-in wires energe and are connected to said circuit means, the lamps of one column being staggered relative to the lamps of the other column with the bases interdigitated and facing the adjacent column; and a multiple reflector system comprising a pair of adjacent strip-like reflector panels each associated with a respective one of said columns of lamps and having a column of side-by-side lamp-receiving cavities on its front side formed with reflecting surfaces defining individual lamp reflectors which respectively are aligned behind the lamps associated therewith, the individual reflector cavities of one panel being staggered relative to the individual reflector cavities of the

other panel, and each reflector panel being foreshortened with respect to the lamps associated therewith but covering the lead-in wires and substantial portions of the bases of lamps



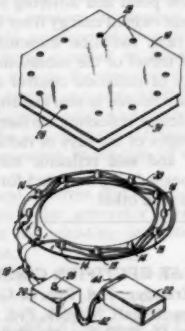
associated with the adjacent reflector panel, whereby the lead-in wires and base portions associated with one panel underlie the adjacent panel to be hidden thereby.

4,164,008

ILLUMINATED ARTICLE OF CLOTHING

Garry E. Miller, Los Angeles, and Michael Dalke, Shaster, both of Calif., assignors to Stanley M. Meyer, Merrick and Barbara Schwartz, Floral Park, both of, N.Y., part interest to each

Filed Feb. 24, 1977, Ser. No. 771,750
Int. Cl.[2] F21V *33/00*; A47G *33/16*; D06C *15/00*
U.S. Cl. 362—103 **14 Claims**



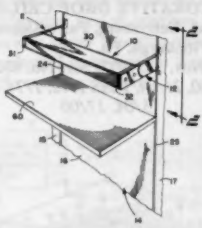
1. An article of clothing comprising:
(a) a garment material having front and rear surfaces;
(b) a single thin supple, printed circuit sheet, said printed circuit sheet being a film of insulating material providing mounting pads and electrical interconnections therebetween;
(c) a plurality of light emitting devices electrically connected directly to said mounting pads and supported by said printed circuit sheet;
(d) adhesive means integrally coupling said printed circuit sheet to the rear of said garment material with only said light emitting devices protruding through said garment material to the front surface thereof whereby said garment material will retain its flexible characteristics, and
(e) circuit means separate from and electrically connected to said printed circuit sheet and adapted to interconnect to a source of energy for illuminating said light emitting devices.

4,164,009

LIGHT FIXTURE

Justin M. Maguire, Jr., Cleveland Heights, and Thomas M. Edwards, Broadview Heights, both of Ohio, assignors to Hauserman, Inc., Cleveland, Ohio

Filed Mar. 30, 1977, Ser. No. 782,991
Int. Cl.[2] F21V *33/00*; F21S *3/02*; F21V *21/00*
U.S. Cl. 362—127 **21 Claims**



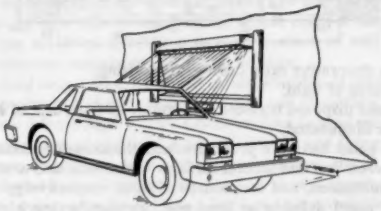
1. In combination, an interior partition including panels having vertical rows of slots therein, a light fixture having an elongated housing, and bracket means at each end of said housing, each said bracket means at each end of said housing including two pivotally connected plates for angular adjustment of said housing, and means releasably to secure each said bracket means to one of said rows of slots whereby said fixture may be supported on said partition at substantially any elevation as determined by the slots of said rows.

4,164,010

ILLUMINATED BANK WINDOW

David H. Finch, 5205 Quail Meadows Dr., Raleigh, N.C. 27609

Filed Dec. 22, 1977, Ser. No. 863,076
Int. Cl.[2] F21S *1/02*
U.S. Cl. 362—147 **3 Claims**



1. In combination with a bank window construction of the type mounted in a building wall and including a frame having an upper horizontal member and a window so mounted in said wall that automobiles may stop therealong and transact business with a teller on the other side of the window, a lighting apparatus comprising:
(a) a light housing extending generally parallel to said upper horizontal member of said frame and having means associated therewith for mounting the housing adjacent the upper frame member;
(b) said light housing including opaque front, rear, top and side walls, and a light transmitting bottom wall, an elongated light source mounted in said housing parallel to the front wall and substantially in the forward portion of said housing;
(c) said light housing further including an elongated reflector means extending substantially the entire length of said housing and positioned above and behind said light source;
(d) said light transmitting bottom wall being provided with at least a prismatic surface portion;

(e) said light source, reflector, and prismatic surface so arranged with relation to each other that the major portion of the light from said light source, when activated, is directed from said apparatus along an asymmetric path having a forwardly directed vector, while only a minor portion of the light is directed along the path having a rearwardly directed vector.

4,164,011

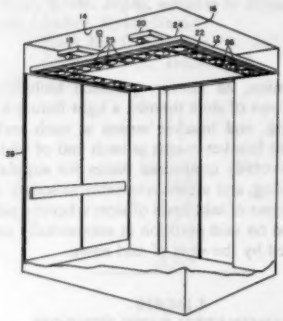
DECORATIVE DROP CEILING

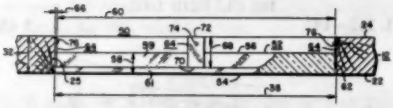
Edward F. Sherwood, Gettysburg, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 11, 1977, Ser. No. 850,564

Int. Cl.[2] F21V *21/00, 21/04;* F21S *1/02, 1/14, 3/02, 3/14;* F21V *5/04, 17/00*

U.S. Cl. 362—148 **9 Claims**





1. A decorative drop ceiling, comprising:

a source of light;

a panel disposed between said source of light and an area to be illuminated;

said panel having a predetermined thickness dimension between first and second surfaces which face said area to be illuminated, and said source of light, respectively;

said panel defining at least one opening having a surface which extends between said first and second surfaces, with the opening having a predetermined configuration and dimensions;

a light transmissive lens in said at least one opening having first and second surfaces which face said area to be illuminated and said source of light, respectively, with the first surface of said lens being substantially co-planar with the first surface of said panel;

said lens having a thickness dimension between its first and second surfaces which is less than the thickness dimension of said panel;

the first surface of said lens having substantially the same configuration and dimensions as said opening;

the outer periphery of said lens being recessed, starting a predetermined dimension from the first surface of the lens and extending to the second surface, to provide a first outer surface which snugly fits the opening in said panel, and a second outer surface which is spaced from the surface of the opening to provide a predetermined space between the lens and panel;

and fastener means in said predetermined space which secure the lens in the opening;

said fastener means including light transmissive means having a first portion in said predetermined space, and a second portion which extends out of said space, adjacent to the surface of the opening, means joining said first portion to the second outer surface of said lens, and means fixing said second portion to the surface of the opening in the panel.

4,164,012

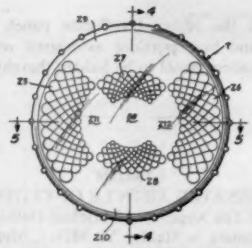
LUMINAIRE APPARATUS FOR REFLECTING RADIANT ENERGY AND METHODS OF CONTROLLING CHARACTERISTICS OF REFLECTED RADIANT ENERGY

John E. Gulliksen, Shrewsbury, Mass., assignor to Koehler Manufacturing Company, Marlborough, Mass.

Filed Jun. 17, 1977, Ser. No. 807,372

Int. Cl.[2] F21V *21/28*

U.S. Cl. 362—282 **44 Claims**



1. Luminaire apparatus comprising a source of radiant energy, reflector means located in spaced relation to the source of radiant energy, said reflector means presenting a plurality of reflecting surfaces derived from the parabolic, said surfaces having a common focal point and differing focal lengths and being arranged to reflect radiant energy from the said source in substantially parallel rays, radiation transmitting means supported in the paths of travel of the substantially parallel rays and having a plurality of radiation control zones the planar projections of which are related in size and shape to the planar projections of paraboloidal reflecting surfaces for selectively controlling characteristics of the rays of radiant energy transmitted therethrough, and said reflector means and radiant energy transmitting means being mounted for rotary displacement of one relative to the other.

4,164,013

SIX-PULSE RECTIFIER CIRCUIT

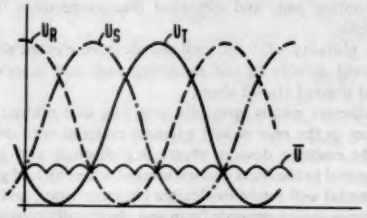
Wolfgang Kaufhold, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Dec. 15, 1977, Ser. No. 860,967

Claims priority, application Fed. Rep. of Germany, Dec. 30, 1976, 2659564

Int. Cl.[2] H02M *1/12*

U.S. Cl. 363—45 **1 Claim**



1. In a six pulse rectifier circuit, having a rectifier bridge with six valves arranged in the secondary circuit of a three

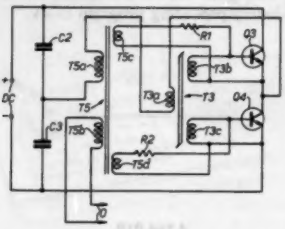
phase transformer and shunted by a load resistor arrangement for sensing the actual voltage value for a fast control device, the improvement comprising the internal resistance of the transformer being increased to the extent that the transformer produces a three phase output in the secondary circuit having wave forms with a trapezoidal shape, and the resistance of the load resistor arrangement matched to the internal resistance of the transformer, such that at least three, but no more than four of the total six valves of the rectifier bridge are always commutating.

4,164,014

CONVERTER POWER SUPPLY APPARATUS

John E. Crowe, and John J. Shanley, both of Bishop's Stortford, England, assignors to Gould Advance Limited, Essex, England

Filed Jun. 12, 1978, Ser. No. 914,897
Int. Cl.[2] H02M *7/00, 1/18*
U.S. Cl. 363—49 **11 Claims**



1. In a power supply apparatus including a direct-current source, oscillator circuit means including a feedback transformer having primary and secondary winding means, and a pair of semiconductor switching devices alternately operable to couple said source to a load circuit via said primary winding means, thereby to produce alternating current in said load circuit and in said primary winding means, said secondary winding means being coupled to supply to said switching devices control currents for ensuring a constant relation between said load current and said control currents, and circuit means coupled between said load circuit and said secondary winding means for augmenting said control currents, thereby to assist in commencing oscillation of said oscillator circuit means;

the improvement wherein said oscillator circuit means further includes pulse generator means for generating a starter pulse for initiating oscillation of said oscillator circuit means.

4,164,015

CONTROL CIRCUIT FOR POWER CONVERTER

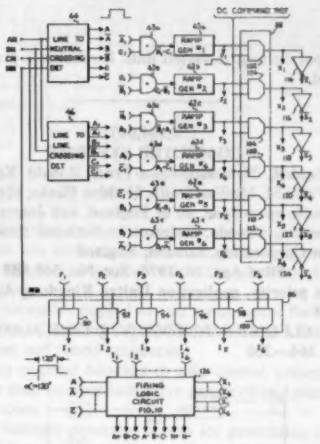
Paul M. Espelage, Ballston Lake, N.Y., and Loren H. Walker, Salem, Va., assignors to General Electric Company, Salem, Va.

Filed Apr. 10, 1978, Ser. No. 895,188
Int. Cl.[2] H02P *13/24*; H02M *7/155*
U.S. Cl. 363—87 **25 Claims**

1. In a power conversion system for transferring electrical power over a full rectifying and inverting range of operation between a polyphase a.c. source, having a neutral point, and a load by means of a converter having at least one controlled rectifier commonly coupled between each phase leg of the a.c. source and the load and at least one additional controlled rectifier coupled between between the neutral point and the load, a firing control circuit responsive to a command signal for rendering each of said controlled rectifiers individually conductive at prescribed firing angles with respect to the phase voltage crossings of said a.c. source for plural operating modes, comprising in combination:

(a) first circuit means coupled to and responsive to said a.c. source and generating plural time related logic signals whose relative time relations are fixed in relation to the phase voltages of the polyphase a.c. source;

(b) a plurality of waveform generators, equal in number to the phase leg controlled rectifiers, coupled to said first circuit means, being responsive to a predetermined number of said time related fixed logic signals and generating respective firing reference waveforms having periodically repetitive amplitude varying characteristics which vary in a single direction for a period greater than one half cycle of each phase voltage, with successive waveforms having mutually overlapping period portions where the amplitude characteristic varies whereby any of said controlled rectifiers are adapted to be fired in response to two adjacent firing reference waveforms;



(c) second circuit means coupled to said plurality of waveform generators and said a.c. source and generating other plural time related logic signals whose relative time relations are fixed in relation to a comparison of said firing reference waveforms with zero voltage;

(d) third circuit means coupled to said plurality of waveform generators and said command signal and generating plural time related logic signals whose relative time relations are variable in response to a comparison of said firing reference waveforms with said command signal; and

(e) digital logic circuit means coupled to said circuit means and being responsive to said fixed and time variable logic signals to combine said logic signals in accordance with a predetermined logic control algorithm to generate and apply firing signals to said controlled rectifiers in response to the magnitude of said command signal.

4,164,016

CURRENT SENSING SYSTEM

Walter F. Schuchard, Hingham, Mass., assignor to ESB Incorporated, Philadelphia, Pa.

Filed Nov. 13, 1978, Ser. No. 960,075
Int. Cl.[2] H02M *7/155*
U.S. Cl. 363—88 **4 Claims**

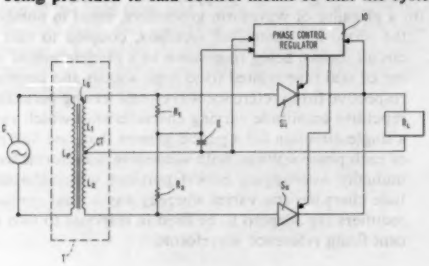
1. In a system receiving a power signal through a transformer having a center tapped secondary winding and having control means for adjusting the power signal to produce an output having a predetermined output current characteristic, a current sensing system comprising:

(a) two resistors connected in series across the secondary winding;

(b) a capacitor connected between the common junction of the resistors and the center tapped terminal; and

(c) means for detecting the voltage between the common

junction of the impedances and the center tap, said voltage being provided to said control means so that the system



output current is varied until it reaches a predetermined level.

4,164,017

COMPUTER SYSTEMS

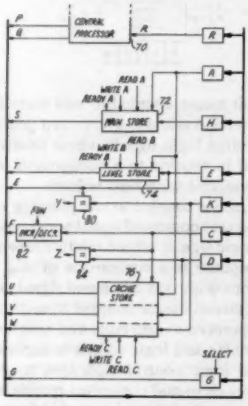
Brian Randell, Newcastle-upon-Tyne; Ronald Kerr, Whitley Bay; Peter M. Melliar-Smith, Heddon Banks; Hugh C. Lauer, Newcastle-upon-Tyne, all of England, and James J. Horning, Willowdale,, Canada, assignors to National Research Development Corporation, London, England

Filed Apr. 16, 1975, Ser. No. 568,683

Claims priority, application United Kingdom, Apr. 17, 1974, 16766/74

Int. Cl.[2] G06F *9/20*; G06E *9/19*; G06F *11/00, 13/00*

U.S. Cl. 364—200 **8 Claims**



1. Data processing apparatus for use in data processes which utilize a nested set of program blocks, each program block being followed by an acceptance test before entry into a succeeding block or return to an outer enclosing block, said apparatus being operative to preserve the states that have been taken up by each of a plurality of items of information immediately prior to the beginning of each block where said items of information change state during such block so that the states of such items of information prevailing at the beginning of the block can be restored if required, said apparatus comprising:

first memory means for storing the current states of items of information;

means for storing indicators which distinguish successive program blocks and indicate entry into and exit from a program block;

second memory means for storing previous states of items of information including storing of indicators of the program blocks in which such states occurred;

means for generating a "pass" signal or a "fail" signal on completion of an acceptance test;

means for restoring the states of the memory means to that pertaining immediately prior to entry into a current program block if a "fail" signal is generated, said restoring means including means for discarding from the first memory means the items of information stored during the current program block, and means for transferring from the second memory means to the first memory means the states stored in the second memory means for the immediately preceding program block of those items of information which are discarded from the first memory means; and

means for progressing the states of the memory means if a "pass" signal is generated, said progressing means including means for discarding from the second memory means at least those items of information local to the immediately preceding program block and those items of information for which entries already exist in second memory means in the immediately preceding program block.

4,164,018

METHOD AND APPARATUS FOR STEERING A SPACECRAFT AND REGULATING ITS ONBOARD SUPPLY VOLTAGE

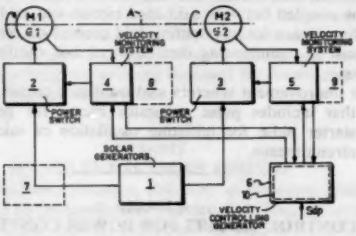
Francis Legrand, Le Chesnay, France, assignor to Societe Nationale Industrielle Aerospatiale, Paris, France

Filed Apr. 14, 1977, Ser. No. 787,653

Claims priority, application France, Apr. 14, 1976, 76 11087; Nov. 12, 1976, 76 34217

Int. Cl.[2] G05D *1/00*; G05F *7/00*

U.S. Cl. 364—424 **7 Claims**



1. An inertial device for regulating the on-board voltage of a spacecraft and for steering said spacecraft comprising

at least two contra-rotating dynamo-electric machines with alternating magnetic fields and having motor and generator modes of operation,

solar generator means to power said machines,

power switching means connected to said machines to connect said solar generator means to said machines during said motor mode of said machines,

velocity control means also connected to said machines during said motor mode,

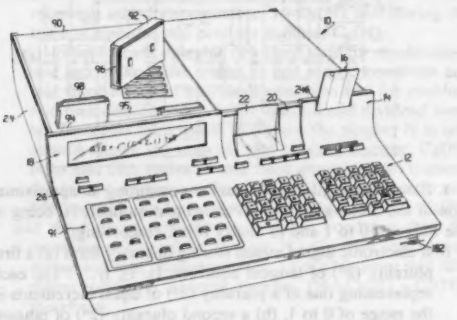
said power switching means also connected to said machines to connect an on-board electrical load of the spacecraft to said machines during said generator mode of said machines,

and control means for determining the time of opening of said power switching means.

4,164,019
PROGRAMMABLE CALCULATOR INCLUDING ALPHANUMERIC DISPLAY MEANS

Emil E. Olander, Jr., Fort Collins; Rex L. James, Loveland; Ivar W. Larson, Loveland; Wayne F. Covington, Loveland; Jack M. Walden, Loveland; Robert E. Watson, Loveland; Francis J. Yockey, Loveland; Fred Wenninger, Jr., Loveland, and Homer C. Russell, Berthoud, all of Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Division of Ser. No. 510,921, Sep. 30, 1974, Pat. No. 4,028,538, which is a division of Ser. No. 212,581, Dec. 27, 1971, Pat. No. 3,839,630. This application Jun. 1, 1977, Ser. No. 802,295
Int. Cl.[2] G06F *3/12, 3/14;* G06K *15/02, 15/18*
U.S. Cl. 364—710 2 Claims



1. An electronic calculator comprising:

keyboard input means having a plurality of keys for entering one or more lines of alphameric information, including algebraic expressions and selected commands, into the calculator;

memory means for storing each line of alphameric information as it is being entered into the calculator from said keyboard input means and for storing a program comprising a plurality of lines of alphameric information entered into the calculator;

processing means, coupled to said keyboard input means and memory means, for selectively processing a single line of alphameric information entered into the calculator and a program comprising a plurality of lines of alphameric information previously stored in said memory means to perform selected commands and to compute the results of selected algebraic expressions;

display means, coupled to said processing means, for visually displaying alphameric information; and

printer means, coupled to said processing means, for printing alphameric information;

said memory means including a plurality of data storage registers for storing data entered into the calculator from said keyboard input means;

said keyboard input means being operative for entering a data entry command, including specification of an alphameric message and one or more of said data storage registers into which subsequently entered data is to be stored;

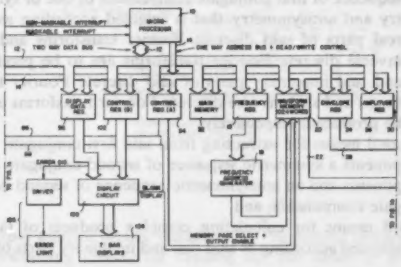
said keyboard input means being further operative for entering a print command, including specification of the one or more of said data storage registers specified in said data entry command;

said processing means being responsive to a data entry command and a print command, sequentially encountered during processing of a line of alphameric information, for causing said display means to display the alphameric message specified in said data entry command, for permitting entry by the user of an amount of data corresponding to the number of data storage registers specified in said data entry command, for storing that entered data in the corresponding data storage registers, and for causing said printer means to print the contents of the data storage registers specified in said data entry and print commands.

4,164,020
PROGRAMMABLE SOUND SYNTHESIZER

Robert C. Griffith, Encino, Calif., assignor to Dynamic Sciences International, Inc., Woodland Hills, Calif.

Filed Apr. 28, 1978, Ser. No. 900,883
Int. Cl.[2] G06F *1/02*
U.S. Cl. 364—718 10 Claims



1. A circuit having an input means for receiving instructions, an output data bus, and output means for generating an audible tone, said circuit for the synthesization of a plurality of audible tones comprising:

a central processor coupled to said input means for transferring and manipulating digital information in a selectively controlled and timed sequence;

a frequency register coupled to said central processor for storing a tone number indicative of one of said plurality of audible tones;

frequency/address generator means for generating a plurality of addresses at a rate in response to said tone number, said frequency/address generator means including digital integrating means for generating an increment in address by integrating said tone number over time and generating said increment when integration of said tone number equals a predetermined magnitude, said frequency/address generator means being coupled to said frequency register;

waveform memory means for storing and writing a plurality of binary numbers indicative of waveform on said output data bus, said frequency address generator means being coupled to said waveform memory means, said waveform memory means writing said plurality of binary numbers in response to said plurality of addresses, said data bus being coupled to said output means, said output means generating one of said plurality of audible tones in response to said plurality of binary numbers coupled thereto,

whereby tone frequency is determined by the rate at which said waveform memory means is collectively read and waveshape is determined by the stored contents of said waveform memory means.

4,164,021
2M-POINT DISCRETE FOURIER TRANSFORM CALCULATOR COMPRISING A PRE-PROCESSOR FOR TWICE PERFORMING EXTRACTION OF CONJUGATE SYMMETRIC AND/OR ANTISYMMETRIC COMPONENTS

Takao Nishitani, and Rikio Maruta, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Oct. 5, 1977, Ser. No. 839,537
Claims priority, application Japan, Oct. 6, 1976, 51-120630
Int. Cl.[2] G06F *15/34*
U.S. Cl. 364—726 3 Claims

1. A discrete Fourier transform calculator responsive to a sequence of N-point discrete complex input data, where N is

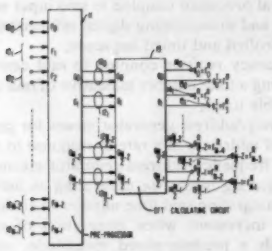
representative of an even number, for producing a prescribed one of a sequence of real parts of N-point discrete Fourier transforms of said input data, a sequence of imaginary parts of said Fourier transforms, a sequence of real parts of N-point inverse discrete Fourier transforms of said input data, and a sequence of imaginary parts of said inverse discrete Fourier transforms, said calculator comprising:

a pre-processor responsive to said input data for producing a sequence of N/2-point complex intermediate data, said pre-processor comprising, in turn:

first means for extracting from said input data a truncated sequence of first conjugate components of one of symmetry and antisymmetry that is selected according as said real parts of said discrete Fourier transforms and said inverse discrete Fourier transforms are to be produced and said imaginary parts of said discrete Fourier transforms and said inverse discrete Fourier transforms are to be produced, respectively;

second means for extracting from said first conjugate components a symmetric sequence of second conjugate components and an antisymmetric sequence of second conjugate components; and

third means for calculating complex products of factors selected according as said real and imaginary parts of said



discrete Fourier transforms and said real and imaginary parts of said inverse discrete Fourier transforms are to be produced and the second conjugate components of one of said symmetric and antisymmetric sequences that is selected according as said real parts of said discrete Fourier transforms and said inverse discrete Fourier transforms and said imaginary parts of said discrete Fourier transforms and said inverse discrete Fourier transforms are to be produced, respectively, first algebraic sums of said complex products and the respective second conjugate components of the other of said symmetric and antisymmetric sequences, second algebraic sums of said complex products and the respective second conjugate components of said other sequence, and conjugate complex data of said second algebraic sums, said first algebraic sums and said conjugate complex data providing said N/2-point complex intermediate data; and

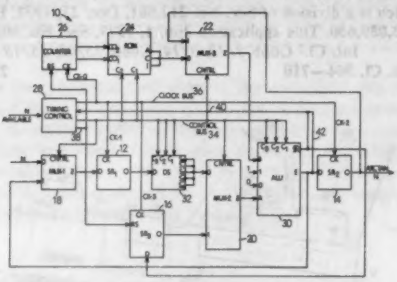
an N/2-point discrete Fourier transform calculating circuit having real output terminals N/2 in number, and imaginary output terminals, also N/2 in number, responsive to said N/2-point complex intermediate data supplied thereto as N/2-point complex input data for supplying said real and imaginary output terminals with the transforms of said prescribed sequence.

4,164,022

ELECTRONIC DIGITAL ARCTANGENT COMPUTATIONAL APPARATUS

Glen D. Rattlingourd, Salt Lake City, and John W. Zscheile, Jr., Murray, both of Utah, assignors to Sperry Rand Corporation, New York, N.Y.

Filed May 5, 1978, Ser. No. 903,278
Int. Cl.[2] G06F *15/34*
U.S. Cl. 364—729 **5 Claims**



1. Electronic digital apparatus for computing an approximation of the arctangent of a given tangent number, N, being in the range of 0 to 1 and in binary form, comprising:

first electronic digital means storing in binary form (a) a first plurality (2^n) of tangent numbers, I_1, I_2, I_j . . . I_{2n}, each representing one of a plurality (2^n) of equal increments in the range of 0 to 1, (b) a second plurality (2^n) of tangent numbers, C_1, C_2, C_k . . . C_{2n}, each representing the center of a corresponding one of said increments, and (c) a third plurality (2^n) of numbers, A_1, A_2, A_i . . . A_{2n}, each representing the arctangent of one of said second plurality of center numbers C_k, where n=1, 2, 3 . . . ;

second electronic digital means operable in a first condition for receiving and storing in binary form the number N;

third electronic digital means operable in a first condition for receiving the number N from said second means and for successively receiving said increment number I_j from said first means and comparing the same with said number N to determine in which one of said plurality of equal increments said number N is located;

fourth electronic digital means for receiving the number N from said second means and successively forming a product number, $C_k(N)$, for each center number corresponding to the increment number I_j being compared to N;

fifth electronic digital means operable in a first condition for receiving and storing in binary form the product number $C_k(N)$;

transmission means for transmitting signals among said electronic digital means;

control means progressing through successive states during the computation of said approximation and operable in a first state for conditioning said second and third means to said first conditions and for enabling said transmission means to (a) transmit the number N from said second means to said third means, (b) simultaneously and successively transmit said increment numbers I_j from said first means to said third means, (c) transmit the number N from said second means to said fourth means as each increment number I_j is compared in said third means, (d) transmit a number C_k from said first means to said fourth means as each increment number I_j is compared in said third means and (e) transmit the product number $C_k(N)$ from said fourth means to said fifth means;

said third means, after said comparison determines in which one of said plurality of equal increments the number N is located, operable in a second condition for receiving said center number C_k of the one of said increments in which said number N is located and for receiving again said

number, N, to form a dividend number, $N-C_k$, from said received numbers;

said control means operable in a second state for conditioning said third means to a second condition and for enabling said transmission means to (a) transmit the center number C_k of the one of said increments in which said number N is located from said first to said third means and (b) transmit the number N from said second to said third means;

said second means operable in a second condition for then receiving said dividend number, $N-C_k$, and storing the same in place of the number, N;

said third means operable in a third conditions for receiving said product number, $C_k(N)$, from said fifth means and adding one thereto to form a divisor number, $1+C_k(N)$;

said fifth means operable in a second condition for then receiving said divisor number, $1+C_k(N)$, and storing the same in place of said product number, $C_k(N)$;

said control means operable in a third state for conditioning said second and fifth means to said second condition and said third means to said third condition and for enabling said transmission means to (a) transmit said dividend number from said third means to replace the number N in said second means, (b) transmit said product number, $C_k(N)$, from said fifth means to said third means and (c) transmit the formed divisor number from said third means to said fifth means to replace therein the product number, $C_k(N)$;

said third means operable in a fourth condition then for receiving said dividend number, $N-C_k$, from said second means and said divisor number, $1+C_k(N)$, from said fifth means to form a quotient number, $(N-C_k)/[1+C_k(N)]$, therefrom;

sixth electronic digital means for receiving said quotient number from said third means and storing the same in binary form;

said control means operable in a fourth state for conditioning said third means to said fourth condition and for enabling said transmission means to transmit said quotient number from said third means to said sixth means;

said control means operable in a fifth state for conditioning said third means to a fifth state and for enabling said transmission means to (a) transmit a number, A_i, from said first means to said third means and (b) transmit said quotient numbe from said sixth means to said third means;

said third means operable in a fifth condition thereafter for receiving the number, A_i, from said first means which represents the arctangent of said one of said plurality of center numbers, C_k, used in forming the quotient number and for receiving said quotient number from said sixth means to form the sum thereof, $A_i+(N-C_k)/[1+C_k(N)]$, which approximately equals the arctangent of the known tangent number, N.

4,164,023

PERMUTATION MEMORIES

Harper J. Whitehouse, and Jeffrey M. Speiser, both of San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Division of Ser. No. 747,148, Dec. 3, 1976. This application Sep. 22, 1977, Ser. No. 835,765

Int. Cl.[2] G11C 11/40; G06G 7/19

U.S. Cl. 364—862 **9 Claims**

1. A permutation memory comprising:

an input control means for decoding, having a plurality L of inputs for an L-bit binary number, $B_1, B_2 \ldots B_L$, and a plurality 2^L of outputs;

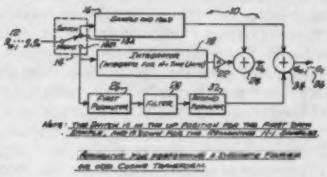
means, connected to the decoding means, for initiating the read-in of the L-bit number;

means for applying an input signal,

a first plurality 2^L of switching means, connected to the 2^L outputs of the decoding means and to the signal applying means, each of the switching means being in a normally open condition;

a plurality 2^L of means, connected to the switching means, for storing a charge when a specific switching means, connected to a corresponding charge storing means, is in a closed condition;

a second plurality 2^L of switching means, connected to the first plurality of switching means and to the charge storing means;



output control means, connected to the second plurality of switching means, for reading out the states of the 2^L charge-storing means, as to the amount of charge in each;

means, connected to the read-out means, for initiating the read-out;

means, connected to the second plurality of switching means, for discharging the charge storing means.

4,164,024

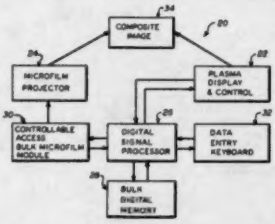
INFORMATION RETRIEVAL SYSTEM FOR PROVIDING RETRIEVABLE UPDATEABLE DISPLAY OF A PERMANENT MICROFILM RECORD

Eli Gilbert, 545 W. End Ave., New York, N.Y. 10024

Filed May 9, 1977, Ser. No. 794,756

Int. Cl.[2] G06F 3/14

U.S. Cl. 364—900 **13 Claims**



1. An information retrieval system for providing a retrievable updateable display of a permanent microfilm record comprising a gas panel display means capable of providing a composite visual display and having a gas panel portion, said gas panel display means having a front and a rear and a display control means for said gas panel portion thereof; microfilm record projection means capable of retrievably providing a static optical image of a selected permanent microfilm record to the rear of said gas panel display means from a plurality of such permanent microfilm records for selectably providing a projected visual display thereof visible through the front of said gas panel display means; updateable memory means capable of selectably retrievably providing both variable cursor position information and updateable stored information corresponding to selectable portions of said selectable permanent records, said memory means being operatively connected to said display control means, said display control means selectably providing an electronically produced gas panel visual display image on said gas panel display means of said corre-

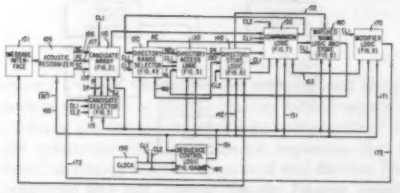
sponding retrievable updateable stored information provided from said memory means in a variable operation selected position in said display dependent on said provided cursor position information said display control means including means for selectably superimposing said electronically produced gas panel visual display image over any portion of said static optical image; keyboard selection means operatively connected to said memory means for enabling both operator updating of the corresponding stored information content of said selectable portions of said selectable permanent records in said composite visual display and operator retrievable selection of said updated information content; and condition responsive process controller means operatively connected to said update and selection means, to said microfilm record projection means, to said display control means and to said memory means for controllably providing a selected retrievable updated composite visual display in response to a single operator selection of said permanent record on said selection means, said process controller means controllably providing said composite visual display in response to said single operator selection and including means for enabling a projection of said selected retrievable permanent microfilm record static optical image by said microfilm record projection means while substantially simultaneously enabling an electronically produced gas panel superimposable image of said corresponding updated stored information by said gas panel display means with said electronically produced gas panel display image visually supplanting said selectable portions of said selectably retrieved projected permanent microfilm record in said controllably provided composite visual display, whereby any portion of a display of a microfilm record, whether free from or formatted, may be visually altered.

4,164,025

SPELLED WORD INPUT DIRECTORY INFORMATION RETRIEVAL SYSTEM WITH INPUT WORD ERROR CORRECTIVE SEARCHING

John J. Dubnowski, Bethlehem Township, Hunterdon County, and Aaron E. Rosenberg, Berkeley Heights, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 13, 1977, Ser. No. 860,101
Int. Cl.[2] G06F *7/22*
U.S. Cl. 364—900 **31 Claims**



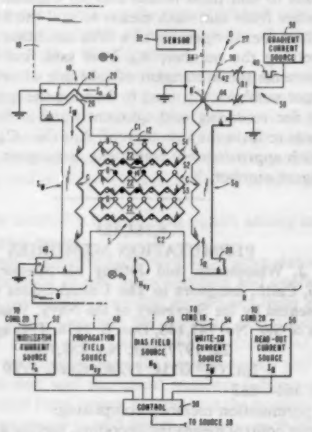
1. A circuit for recognizing a sequence of spelled character signals comprising a directory store for storing a plurality of reference words each having a set of prescribed characters; means for receiving a sequence of spelled character signals; means connected to said receiving means responsive to each received spelled character signal for generating a set of probable characters; means connected to said probable character set generating means for storing a set of probable characters for each spelled character signal in a predetermined position of a position ordered array; means responsive to the storing of the final character signal probable character set of the sequence for generating a candidate word comprising a probable character from each spelled character position of the array; means for storing the generated candidate word; means responsive to the storing of said generated candidate word for generating a first signal; directory store search means responsive to said first signal for determining directory store reference words which correspond to the sequence of spelled character signals comprising means responsive to the stored candidate word for selecting a sequence of directory store reference words; means jointly responsive to said selected sequence of directory store reference words and said stored candidate word for comparing the characters of each word of said selected sequence of directory store reference words with the corresponding characters of said stored candidate word in left to right order to detect directory store reference words that match said stored candidate word; means responsive to the nonmatching directory store reference words of said selected sequence for detecting the rightmost first occurring mismatched position of all nonmatching directory store reference words of the selected sequence; means jointly responsive to the absence of matching directory store reference words in the selected sequence and said detected mismatched position of said selected sequence for generating a modified candidate word and for storing said modified candidate word in said candidate word storing means; means responsive to the storing of said modified candidate word for generating a first signal to initiate a succeeding directory store search; and means responsive to the detection of at least one directory store reference word that matches a stored candidate word in a directory store reference word sequence search for identifying the sequence of spelled character signals as said matching directory words.

4,164,026

CONTIGUOUS ELEMENT FIELD ACCESS BUBBLE LATTICE FILE

George S. Almasi, Katonah, and Yeong S. Lin, Mount Kisco, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1977, Ser. No. 866,195
Int. Cl.[2] G11C *19/08*
U.S. Cl. 365—3 **28 Claims**

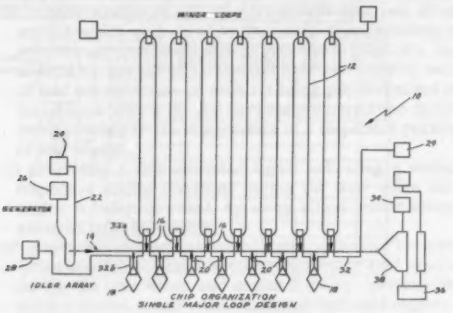


8. A magnetic bubble domain lattice device, comprising:
a magnetic film in which said bubble domains can be moved,
a lattice of interacting bubble domains in said film,
a plurality of contiguous element propagation patterns for moving bubble domains in said lattice in response to the reorientation of a magnetic field in the plane of said pattern there being magnetic charged walls magnetically coupled to each of said bubble domains in said lattice during movement of said bubble domains.

4,164,027
FAULT TOLERANT BUBBLE MEMORY WITH A SINGLE MAJOR LOOP HAVING AN INTEGRAL STATIONARY REGISTER

G. Patrick Bonnie, Minneapolis, and William J. McGinnis, Jr., Prior Lake, both of Minn., assignors to Control Data Corporation, Minneapolis, Minn.

Filed Apr. 7, 1978, Ser. No. 894,444
Int. Cl.[2] G11C *19/08*
U.S. Cl. 365—15 3 Claims



1. A fault tolerant bubble memory device comprising, a field access type bubble memory employing the major loop minor loop configuration having additional redundant minor loops, all minor loops being associated with a major loop,

said major loop having a bubble access location for a magnetic bubble associated with each minor loop and at least one additional bubble access location between each of the access locations associated with minor loops,

a plurality of bubble idlers forming in combination with a propagation path portion of the major loop a stationary register having a position displaced relationship to the bubble access location of the associated minor loops, said stationary register being formed in part from a serial propagation track portion of said major loop whereby bubble elements move from one location to another in the presence of a rotating in-plane magnetic field and said bubble idlers being placed in an array form parallel and adjacent to said propagation track portion of said major loop, each idler being associated with one of said additional bubble access locations, and

electrical conductor means for activating a transfer of magnetic bubbles between major loop locations and minor loop locations and between major loop locations and bubble idler locations, said electrical conductor means generally following the path of said propagation track portion of said major loop and having associated with each idler element a current loop of said conductor means such that pulses of current in said conductor means may control transfer of bubbles into and out of said propagation track portion of said major loop.

4,164,028
CURRENT ACCESS BUBBLE MEMORY SYSTEM

Otto Voegeli, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

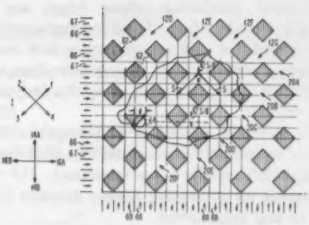
Filed Jun. 9, 1977, Ser. No. 805,196
Int. Cl.[2] G11C *19/08*
U.S. Cl. 365—20 27 Claims

1. A combination suitable for the propagation of bubbles in a bubble supporting material comprising

a first array of regularly spaced parallel conductors connected in parallel to a first current source,

a second array of regularly spaced parallel conductors being oriented substantially orthogonal to said conductors in said first array to form a region of intersections between said first array conductors and said second array conductors and connected in parallel to a second current source,

a plurality of first parallel channels in the bubble supporting material in said region adapted for the movement of bubbles therein, said first channels positioned at an angle of +45° to said conductors in said first array to define a first propagation axis, and

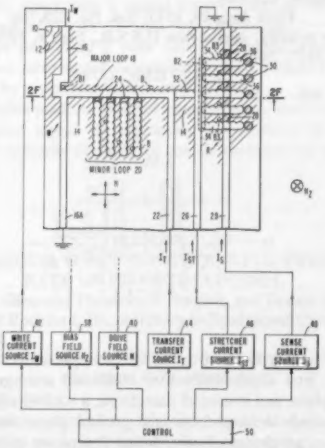


a plurality of second parallel channels in the bubble supporting material in said region adapted for the movement of bubbles therein, said second channels positioned at an angle of −45° to said conductors in said first array to define a second propagation axis orthogonal to said first propagation axis.

4,164,029
APPARATUS FOR HIGH DENSITY BUBBLE STORAGE

George E. Keefe, Montrose, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 645,975, Dec. 31, 1975, abandoned.
This application Oct. 5, 1977, Ser. No. 839,720
Int. Cl.[2] G11C *19/08*
U.S. Cl. 365—36 29 Claims



1. A magnetic bubble domain device for storing information represented by bubble domains in a magnetic medium, comprising:

a first shift register along which bubble domains propagate in response to a reorienting magnetic field in the plane of said magnetic medium,

at least one storage shift register separated from said first shift register for storing information represented by said bubble domains,

said first shift register and said at least one storage shift register being comprised of ion implanted regions of said magnetic medium along which said bubble domains prop-

agate in response to the reorientation of said magnetic field,

transfer means for transferring said information between said first shift register and said at least one storage shift register, said transfer means including:

a magnetic bridge which is comprised of a magnetically soft material bridging the separation between said first shift register and said at least one storage shift register, and

an electrical conductor whose edges are substantially aligned with the edges of said ion implanted regions comprising said first shift register and which overlies non ion implanted regions of said magnetic medium, said electrical conductor being disposed along the length of said first shift register,

wherein at least a portion of said magnetic medium in the area of separation between said first shift register and said storage shift register is ion implanted,

write means for producing bubble domains for representation of said information,

read means for reading said information.

4,164,030

FILM CRYOTRON

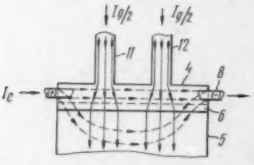
Mikhail J. Kupriyanov, ulitsa Khlobystova, 10, korpus 2, kv. 30; Gennady M. Lapir, korpus 851, kv. 69; Konstantin K. Likharev, Leninsky prospekt, 93, kv. 200; Vasily K. Semenov, korpus 337, kv. 4, and Petr E. Kandyba, korpus 438, kv. 11, all of Moscow, U.S.S.R.

Filed Aug. 29, 1977, Ser. No. 828,766

Claims priority, application U.S.S.R., Sep. 9, 1976, 2392651; Apr. 18, 1977, 2468099

Int. Cl.[2] G11C *11/44*

U.S. Cl. 365—162 **4 Claims**



1. A film cryotron comprising: a superconductive ground plane; a first superconductive electrode arranged on said ground plane and insulated therefrom; a second superconductive electrode arranged on said ground plane and insulated therefrom; an elongated distributed Josephson junction interconnecting said electrodes; as least the first electrode being shaped as a strip extending along the Josephson junction; a control line extending along the Josephson junction above said first electrode; an input line connected to said second electrode; an input line connected to said first electrode at a portion which is spaced from the points of intersection between said control line and the boundaries of said first electrode and from the ends of said junction by a distance which is greater than the width of said first electrode and the depth of penetration of the magnetic field into said junction, said input line having a width which is less than the width of said first electrode.

4,164,031

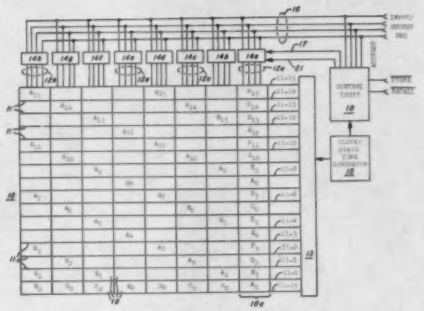
MEMORY SYSTEM

Perry W. Lou, Houston, Tex., and Charles P. Grant, Jr., deceased, late of Dallas, Tex. (by Charles P. Grant, administrator), assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 26, 1976, Ser. No. 745,157

Int. Cl.[2] G11C *11/40, 13/00*

U.S. Cl. 365—233 **22 Claims**



1. A data storage system comprising:

(a) an array of memory cells arranged in rows and columns, the cells of each column having a common input/output conductor;

(b) first commutator means for successively strobing row conductors of said array for enabling the rows of cells associated with said row conductors to receive and to output data on said common input/output conductors;

(c) a bus for transmitting digital data to and from said array; and

(d) second commutator means for selectively interconnecting said columns of memory cells with said bus.

4,164,032

COMPUTER CONTROL OF AN EXHAUST GAS RECIRCULATION DEVICE FOR AN INTERNAL COMBUSTION ENGINE

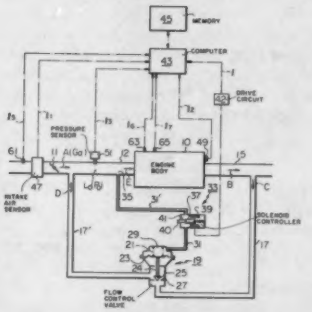
Hidetaka Nohira, Mishima; Kiyoshi Kobashi, Susono, and Jiro Nakano, Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Dec. 7, 1977, Ser. No. 858,533

Claims priority, application Japan, Sep. 27, 1977, 52-115103

Int. Cl.[2] F02M *25/06*; G06F *15/46*

U.S. Cl. 364—431 **9 Claims**



1. A method for controlling an exhaust gas recirculation device of an internal combustion engine, which device has a pressure-operated flow control valve located on a recirculation passageway connecting the engine exhaust system with

the engine intake system, and has an electrically-operated actuator means located on a pressure signal conduit connecting valve for controlling the opening of the flow control valve to control the amount of the exhaust gas to be recirculated, said method comprising the steps of:

(a) initially storing in a memory unit of an electrical computer a set of first values corresponding to the amount of the exhaust gas to be recirculated, each of said first values being predetermined in accordance with a desired amount of exhaust gas to be recirculated when said engine is in a respective operating condition;

(b) initially storing in said memory unit at least one set of second values, each set of second values corresponding to temperature correction factors Ki, where $0 \leqq Ki \geqq 1$, for altering the amount of exhaust gas to be recirculated, each of said second values of each set being predetermined in accordance with a desired temperature correction factor corresponding to the temperature of a respective portion of said engine;

(c) generating a first electrical signal indicating a sensed respective engine condition during the time when said engine is being operated, by using a first sensor means mounted onto said engine;

(d) generating at least one second signal indicating a sensed temperature of a said respective portion of said engine during the time when said engine is being operated, by using a second sensor means mounted onto said engine;

(e) reading, by said computer, programmed to respond to said first and at least one of said second electrical signals, a first stored value corresponding to the sensed engine condition and at least one second stored value corresponding to the temperature correction factor Ki for a sensed temperature;

(f) calculating, by said computer programmed to respond to said read-out values, a third value corresponding to a desired opening of the pressure-operated flow control valve;

(g) forming, by using said calculated value, a third electrical signal which is transmitted to said electrically-operated actuator means for controlling the opening of said flow control valve; and

(h) repeating, at a predetermined interval, steps (c) through (g) during the time said engine is in operation.

8. An exhaust gas recirculating device of an internal combustion engine which comprises:

a recirculation passageway connecting the engine exhaust system with the engine intake system;

a pressure-operated flow control valve located on the recirculating passageway for controlling the amount of exhaust gas to be recirculated;

a pressure signal conduit connecting a pressure signal port in the engine intake with the flow control valve;

an electrically-operated actuator means located in the conduit for controlling the opening of the flow control valve;

a memory device for storing a set of first values corresponding to the amount of the exhaust gas to be recirculated, said first values being predetermined in accordance with desired amounts of exhaust gas to be recirculated at respective engine operating conditions, and for storing at least one set of second values corresponding to temperature correction factors for the recirculated exhaust gas, each of said second values being predetermined in accordance with a desired temperature correction factor for respective temperatures of a respective portion of the engine;

a first sensor means for providing, when the engine is operating, a first electrical signal indicating an engine operating condition;

at least one second sensor means for providing, when the engine is operating, a second electrical signal indicating the temperatures of a respective portion of the engine; and,

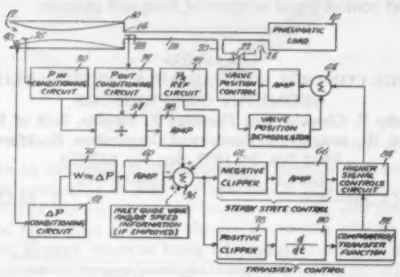
a computer unit programmed, in response to the first and second electrical signals, to read a stored first value and at least one second value, to calculate a value corresponding to opening of the pressure-operated flow control valve from said read-out first and second values, and to form an electrical signal corresponding to said calculated value which is transmitted to the electrically-operated actuator means for controlling the opening of the flow control valve.

4,164,033

COMPRESSOR SURGE CONTROL WITH AIRFLOW MEASUREMENT

Timothy F. Glennon; Theodore E. Sarphie, and Dennis T. Faulkner, all of Rockford, Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Sep. 14, 1977, Ser. No. 833,031
Int. Cl.[2] F04D *27/02;* F02C *9/14*
U.S. Cl. 364—431 **11 Claims**



1. A surge control system for a compressor which provides air to a pneumatic load comprising:

means for generating a pressure ratio signal proportional to a ratio of the outlet pressure of the compressor to the inlet pressure of the compressor,

means for generating a signal proportional to the weight flow rate of the air through the compressor;

means for providing a vent valve command signal if the pressure ratio signal deviates from said weight flow rate signal by a predetermined amount; and

a vent valve position control responsive to said vent valve command signal for regulating the position of a valve which controls the flow of the air through the compressor.

4,164,034

COMPRESSOR SURGE CONTROL WITH PRESSURE RATE OF CHANGE CONTROL

Timothy F. Glennon; Theodore E. Sarphie, and Dennis T. Faulkner, all of Rockford, Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Sep. 14, 1977, Ser. No. 833,032
Int. Cl.[2] F02C *9/14;* F04D *27/02*
U.S. Cl. 364—431 **5 Claims**

1. A control system for preventing surge in a compressor which supplies air to a pneumatic load comprising:

means for sensing the air pressure at the outlet of the compressor;

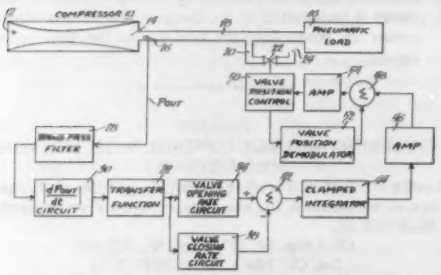
means for generating a signal proportional to the absolute value of the rate of change of the air pressure;

means for generating a first control signal if said signal proportional to the absolute value is greater than a first value;

means for generating a second control signal if said signal proportional to the absolute value is less than a second value;

means for summing said first control signal with said second control signal; and

means coupled to said summing means for generating a valve open signal when said first control signal is received from said



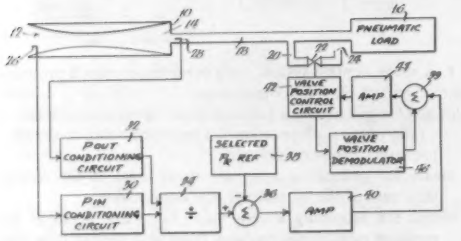
summer, and for generating a valve closed signal when said second control signal is received from said summer.

4,164,035

SURGE CONTROL FOR VARIABLE SPEED-VARIABLE GEOMETRY COMPRESSORS

Timothy F. Glennon, and Theodore E. Sarphie, both of Rockford, Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Sep. 14, 1977, Ser. No. 833,033
Int. Cl.[2] F02C *9/14*; F04D *27/02*
U.S. Cl. 364—431 **13 Claims**



1. A surge control system for a compressor which provides air to a pneumatic load comprising:

means for generating a signal proportional to a pressure ratio of the outlet pressure of the compressor to the inlet pressure of the compressor;

means for generating a signal corresponding to a selected reference pressure ratio;

means for combining the signal proportional to the pressure ratio with the signal corresponding to the selected reference pressure ratio to provide a vent valve command signal representative of an impending surge condition and of a magnitude indicative of the amount of correction necessary to restore the compressor system to a desired operating condition; and

a vent valve position control means responsive to said vent valve command signal for regulating a valve which vents a portion of the air to the pneumatic load in an amount proportional to said vent valve command signal.

7. A surge control system for a variable speed compressor which provides air to a pneumatic load comprising:

means for generating a signal proportional to a pressure ratio of the outlet pressure of the compressor to the inlet pressure of the compressor;

means for generating a signal corresponding to the speed of the compressor;

means for combining the signal proportional to a pressure ratio with the signal corresponding to the speed of the compressor to provide a vent valve command signal representative of an impending surge condition and of a magnitude indicative of the amount of correction necessary to restore the compressor system to a desired operating condition; and

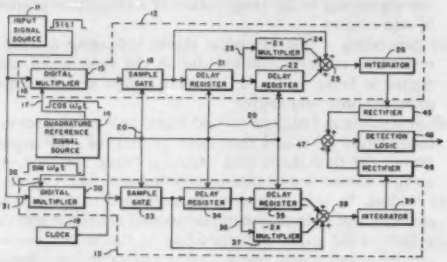
a vent valve position control means responsive to said vent valve command signal for regulating a valve which vents a portion of the air to the pneumatic load in an amount proportional to said vent valve command signal.

4,164,036

QUADRATURE CORRELATION PHASE REVERSAL PULSE DETECTOR

David W. Wax, Seattle, Wash., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 7, 1977, Ser. No. 858,301
Int. Cl.[2] G01R *23/02*; H04M *1/50*; G06F *15/34*
U.S. Cl. 364—486 **19 Claims**



1. Detection apparatus for detecting a tone pulse of known carrier frequency having a phase reversal at a predetermined time during the pulse, said detection apparatus comprising:

input means for supplying a tone pulse input signal;

clipping means for hard limiting the input signal to produce a clipped signal having either of two instantaneous amplitudes;

a reference signal source for generating first and second rectangular wave signals comprising quadrature components of a reference signal having a repetition rate equal to the carrier frequency and either of two instantaneous amplitudes substantially equal to those of the clipped signal;

first and second digital multipliers for multiplying the clipped signal and each of the first and second rectangular wave signals to produce first and second product signals respectively, each having a first value when the instantaneous amplitudes of its multiplicand signals are substantially equal and a second value when the instantaneous amplitudes of its multiplicand signals are different;

sampling means for sampling the first and second product signals at a sampling rate at least twice the highest frequency of interest in the envelope of the tone pulse to provide first and second sample trains respectively, each sample train comprising predetermined numbers of samples preceeding and following the carrier phase reversal in the tone pulse;

first and second shift register means, each having an input terminal connected to receive a separate one of the first and second sample trains, an output terminal for subsequently supplying the sample train, a plurality of storage locations through which the samples are shifted seriatum between the input and output terminals and an intermediate tap for supplying samples intermediate the samples at the input and output terminals, the number of storage locations being sufficient to contain all samples of a tone pulse product signal and the number of storage locations following the intermediate tap being equal to the number of samples preceeding the phase reversal;

first and second multiplier means each having an input terminal connected to the intermediate tap of a separate one of said first and second shift register means and an output terminal at which is produced an inverted and amplified

signal corresponding to the samples at the intermediate tap;

first and second summing means, each for adding the input and output samples of one of said first and second shift register means to the inverted and amplified signal produced by the multiplier means associated therewith;

first and second integrator means for integrating the output signals of said first and second summing means to produce first and second correlation signals respectively;

first and second rectifier means for respectively rectifying the first and second correlation signals;

third summing means for adding the output signals of said first and second rectifier means to produce an autocorrelation signal; and

detection logic means for producing a pulse detection signal when the autocorrelation signal meets predetermined criteria.

16. In a marine vessel position indicating system comprising phase computation apparatus and an array of hydrophone elements located on the vessel for determining the location of the vessel relative to a transponder from transponder signals received by pairs of hydrophone elements, the transponder signals being produced in response to tone pulse interrogate signals of known carrier frequency having a phase reversal at a predetermined time during each pulse, the transponder including an improved pulse detector for precisely detecting interrogate tone pulse signals comprising:

signal input means for converting each received interrogate tone pulse signal into an input signal wherein the carrier is hard limited to form a clipped signal;

a reference signal source for producing first and second quadrature related rectangular wave signals, each having a repetition rate equal to the carrier frequency;

a first correlation channel including a multiplier connected to receive and multiply the clipped signal and the first rectangular wave signal to produce a first product signal, delay means connected to receive a first product signal corresponding to the product of the clipped and first rectangular wave signals, said delay means providing a first signal delay period corresponding to the time between initiation of a tone pulse and its carrier phase reversal, and providing a second signal delay period equal to the duration of the tone pulse, and means for summing and integrating the first undelayed product signal, an amplified and inverted version of the first product signal delayed for the first delay period and the first product signal delayed for the second delay period to produce a first correlation signal indicative of the degree of correlation between the clipped signal and the first rectangular wave signal;

a second correlation channel including a multiplier connected to receive and multiply the clipped signal and the second rectangular wave signal to produce a second product signal, delay means connected to receive a second product signal corresponding to the product of the clipped and second rectangular wave signals, said delay means providing a first signal delay period corresponding to the time between initiation of a tone pulse and its carrier phase reversal, and providing a second signal delay period equal to the duration of the tone pulse, and means for summing and integrating the undelayed second product signal, an amplified and inverted version of the second product signal delayed for the first delay period and the second product signal delayed for the second delay period to produce a second correlation signal indicative of the degree of correlation between the clipped signal and the second rectangular wave signal;

means for combining the first and second correlation signals to produce an autocorrelation signal; and

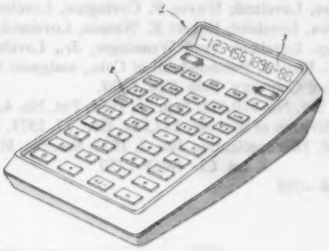
detection logic for producing a pulse detection signal when the autocorrelation signal exhibits characteristics indicative of the presence of a tone pulse signal.

4,164,037

ELECTRONIC CALCULATOR OR MICROPROCESSOR SYSTEM HAVING COMBINED DATA AND FLAG BIT STORAGE SYSTEM

Michael J. Cochran, Richardson, Tex., and Charles P. Grant, Jr., deceased, late of Dallas, Tex. (by Charles P. Grant, Sr., executor), assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 27, 1976, Ser. No. 736,271
Int. Cl.[2] G06F *15/02*
U.S. Cl. 364—700 **18 Claims**



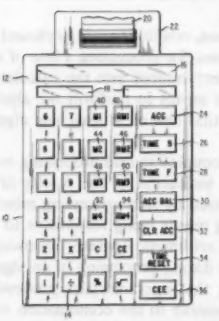
1. In an electronic digital processor system, a data storage system comprising at least one operational register having a plurality of first and second bit storage locations, said first and second bit storage locations sharing a common address, said first bit storage locations being adapted for storing data and said second bit storage locations being adapted for storing flag bits associated with said data.

4,164,038

COMBINATION CALCULATOR AND TIME BILLING DEVICE

Paul Nachtigal, 481 Grove St., Ridgewood, N.J. 07450

Filed Jul. 5, 1977, Ser. No. 812,828
Int. Cl.[2] G04B *47/00*; G04F *10/00*; G06F *15/20*
U.S. Cl. 364—705 **8 Claims**



1. In a portable electronic device having time keeping and calculating functions the combination comprising: first integrated circuit means having calculating and time keeping function; first control means for accessing said first integrated circuit means; first output means interconnected to said first integrated circuit means for displaying the output of said first integrated circuit means; first memory means having capacity to store information by specific address and cumulate said information; said control means including means for generating a time start and time stop signals; said first integrated circuit means including means for accumulating the time elapsed between the said time start and time stop signals; interconnecting means for conveying the accumulated elapsed time to said first memory means for storing said calculated elapsed time and keyboard means having a plurality of field keys and nu-

merical keys; said field keys including a "time start" key, a "time stop" key and an "account key"; and, said memory means comprises a plurality of addressable memories; said addressable memories adapted upon the actuation of one of said "account key" to add elapsed time to stored time.

4,164,039

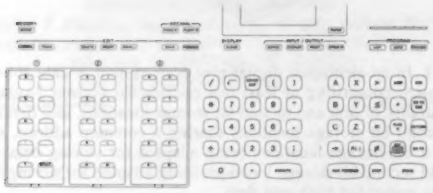
PROGRAMMABLE CALCULATOR INCLUDING A KEY FOR PERFORMING EITHER A SUBTRACTION OR A UNARY MINUS FUNCTION

Emil E. Olander, Jr., Fort Collins; Rex L. James, Loveland; Ivar W. Larson, Loveland; Wayne F. Covington, Loveland; Jack M. Walden, Loveland; Robert E. Watson, Loveland; Francis J. Yockey, Loveland; Fred Weaninger, Jr., Loveland, and Homer C. Russell, Berthoud, all of Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Division of Ser. No. 510,921, Sep. 30, 1974, Pat. No. 4,028,538, which is a division of Ser. No. 212,581, Dec. 27, 1971, Pat. No. 3,839,630. This application Jun. 1, 1977, Ser. No. 802,833

Int. Cl.[2] G06F *7/50*

U.S. Cl. 364—709 **1 Claim**



1. An electronic calculator comprising:

keyboard input means including a plurality of operand and operator keys for entering a line of at least one algebraic statement into the calculator, one of said plurality of keys being operative for entering a minus arithmetic operator into the calculator;

memory means for storing a line of at least one algebraic statement entered into the calculator from said keyboard input means;

processing means, coupled to said keyboard input means and memory means, for processing a line of at least one algebraic statement entered into the calculator and stored in said memory means to perform the algebraic operations specified in that line of at least one algebraic statement; and

output means, coupled to said processing means, for providing a visual indication of the results of algebraic statements processed by said processing means;

said processing means being responsive to the combination of the minus arithmetic operator followed by an operand, encountered during processing of an algebraic statement, for negating that operand, said processing means being further responsive to the combination of a first operand followed by the minus arithmetic operator followed by a second operand, encountered during processing of an algebraic statement, for subtracting the second operand from the first operand.

4,164,040

CCD STORAGE MODULE

Ernst Göettler, Munich, and Otto Grüeter, Krailling, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Feb. 1, 1978, Ser. No. 874,206

Claims priority, application Fed. Rep. of Germany, Feb. 4, 1977, 2704718

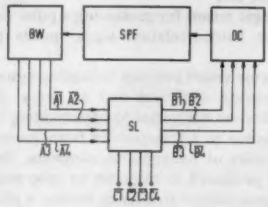
Int. Cl.[2] G11C *11/40*

U.S. Cl. 365—183 **5 Claims**

1. In a charge coupled device storage module of the type having storage positions which are arranged in cascade and which are produced by electrodes arranged in insulated fashion above a semiconductor substrate, and wherein, in respect of each storage position, an item of information incoming as a n-digit binary number is stored in that a quantity of charge consisting of i unit charges is stored in respect of each storage position, where i corresponds to the value of the binary number of the information, the improvement therein comprising:

a decoder connected to said module and comprising n input circuits;

each of said input circuits being assigned one bit position of the information composed of n bits and operable to pro-



duce a charge corresponding to the digit value of the respective position;

each of said input circuits including an output;

an electrode common to all of said outputs of said inputs to form the next storage position of a storage field; and

a plurality of surrender electrodes, each of said surrender electrodes arranged between a respective output of said input circuits and said common electrode for receiving a respective potential to determine whether or not charge produced by the respective input circuits reaches said common electrode.

4,164,041

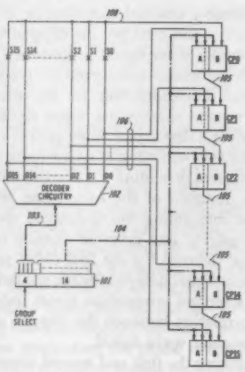
MEMORY ORGANIZATION TO DISTRIBUTE POWER DISSIPATION AND TO ALLOW SINGLE CIRCUIT PACK MEMORY GROWTH

Walter T. Hartwell, St. Charles, Ill.; David L. Hinshaw, Longwood, Fla.; Charles W. Hoffner, II, Naperville, and Wing N. Toy, Glen Ellyn, both of Ill., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 27, 1977, Ser. No. 762,837

Int. Cl.[2] G11C *21/00, 13/00*

U.S. Cl. 365—238 **9 Claims**



1. A word organized random access memory system wherein each word comprises n bits wherein n is an integer greater than 1, the system comprising:

a pluality of word segment organized random access memory modules wherein each word segment comprises n/x bits wherein x is an integer greater than 1 such that n/x is an integer;

a plurality of circuit packs which each contains x individually accessible memory modules and no two memory modules of a circuit pack contain corresponding word segments; and

linkage means for interconnecting said memory modules to form a plurality of groups wherein each group comprises x memory modules and no two memory modules of a circuit pack are members of the same group of said plurality of groups.

DESIGN PATENTS

GRANTED AUG. 7, 1979

ERRATA

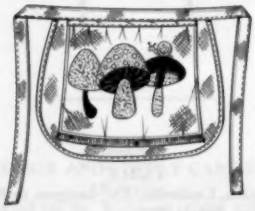
For CLASS	See PATENT NO.
D03–036	252,595

DESIGNS

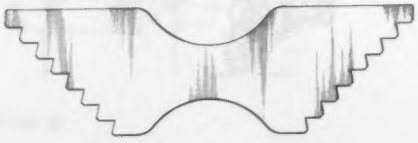
AUGUST 7, 1979

252,536
HOLLOW SANDWICH BREAD
Alexander Goglanian, and George Goglanian, both of 401 E. 15th St., Newport Beach, Calif. 92660
Filed May 19, 1977, Ser. No. 798,501
Term of patent 14 years
Int. Cl. D01—*99*
U.S. Cl. D1—24

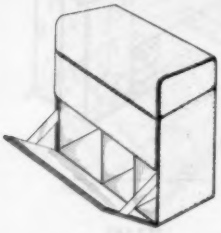
252,537
COMBINED APRON AND DETACHABLE TOWEL
Marion Stimpel, 109-10 Queens Blvd., Forest Hills, N.Y. 11375
Filed Jun. 9, 1977, Ser. No. 805,107
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—227



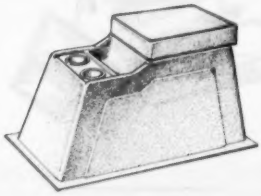
252,538
POM-POM MAKER OR THE LIKE
Hughlett Hollyday, Los Angeles, Calif., assignor to Not Sew, Ltd.
Filed Sep. 2, 1977, Ser. No. 830,370
Term of patent 14 years
Int. Cl. D03—*99*
U.S. Cl. D3—26



252,539
CARRYING CASE FOR A CAMERA AND ACCESSORIES
Donald R. Cohee, Westlake Village, Calif., assignor to Vivitar Corporation, Santa Monica, Calif.
Filed Jun. 27, 1977, Ser. No. 810,301
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D3—33

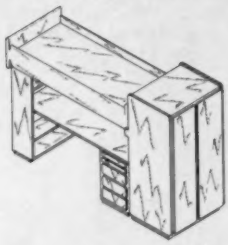


252,540
AUTOMOTIVE CONSOLE ICE CHEST AND COOLER
Cornelius J. Murphy, South Bend, Ind., assignor to Riblet Products Corp., Elkhart, Ind.
Filed Nov. 28, 1977, Ser. No. 855,474
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D3—40

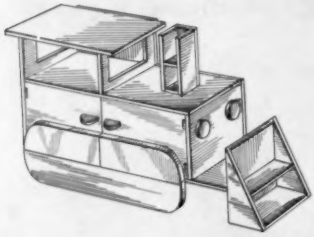


252,541
KEY FOB
Margaret L. Harper, 9561 Port Clyde Dr., Huntington Beach, Calif. 92646
Filed Sep. 12, 1977, Ser. No. 832,517
Term of patent 3½ years
Int. Cl. D3—*01*
U.S. Cl. D3—65

252,542
COMBINED DESK, LOCKER AND BUNK BED UNIT
Charles M. Lewis, Blue Bell, Pa., assignor to Procurement Management Services, Inc., Bala Cynwyd, Pa.
Filed Jul. 15, 1977, Ser. No. 815,979
Term of patent 7 years
Int. Cl. D6—*05*
U.S. Cl. D6—4

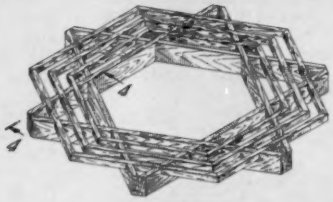


252,543
STORAGE CABINET OR SIMILAR ARTICLE
Tad Taylor, 31 Byram Shore Rd., Byram, Conn. 06830
Filed Jun. 17, 1977, Ser. No. 807,419
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—5



252,544
CHAIR OR SIMILAR ARTICLE
Warren D. Petersen, St. Charles, Ill., assignor to Burd, Inc., Howell Division
Filed Aug. 29, 1977, Ser. No. 828,934
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—31

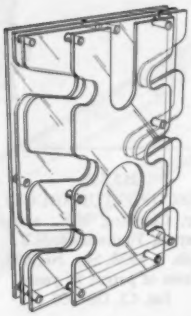
252,545
SEAT FOR A SPA TANK
Melvin B. Palmer, 13900 Jasperson Way, Westminster, Calif. 92683
Filed May 16, 1977, Ser. No. 796,872
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—58



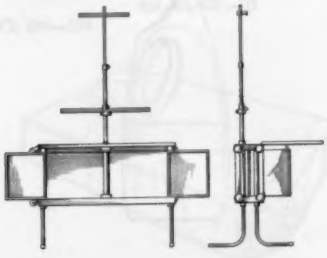
252,546
CHAIR OR SIMILAR ARTICLE
Warren D. Petersen, St. Charles, Ill., assignor to Burd, Inc., Howell Division
Filed Sep. 19, 1977, Ser. No. 834,382
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—73

252,547
TABLE
Nicholas A. Ungaro, Louisville, Ky., assignor to Peters-Revington Corporation, Delphi, Ind.
Filed Aug. 11, 1977, Ser. No. 823,813
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—153

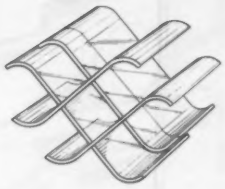
252,548
FOOD PROCESSOR TOOL HOLDER
Paul R. Hoffman, Toronto, and Hans K. Wallenwein, Thornhill, both of Canada, assignors to Plasti-Fab Co. Ltd., Markham, Canada
Filed Dec. 5, 1977, Ser. No. 857,742
Claims priority, application Canada, Jun. 10, 1977, 10-06-77-7
Term of patent 14 years
Int. Cl. D6—*04;* D7—*06*
U.S. Cl. D6—157



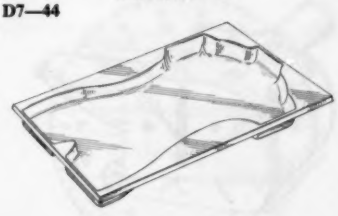
252,549
COMBINED EASEL AND SUPPLY CABINET FOR AN ARTIST
Robert K. Lee, 5242 5th St., Fallbrook, Calif. 92028
Filed Apr. 28, 1977, Ser. No. 792,064
Term of patent 14 years
Int. Cl. D6—*05, 03*
U.S. Cl. D6—179



252,550
WINE RACK
Rodger K. Johnson, 4687 Browndeer La., Rolling Hills Estates, Calif. 90274
Filed Jul. 18, 1977, Ser. No. 816,317
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—190

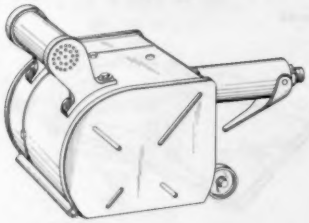


252,551
CAKE PAN
Ethel Keller, 13846 N. 41 Ave., Phoenix, Ariz. 85023
Filed Jun. 27, 1977, Ser. No. 810,547
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—44

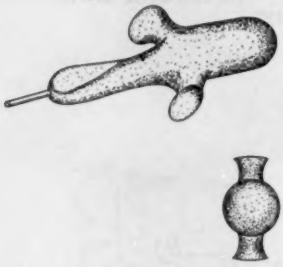


252,552
DEVICE FOR TURNING LIGHT SWITCH ON AND OFF
Norman B. Stoff, 182-37 Tudor Rd., Jamaica Estates, N.Y. 11432
Filed Apr. 26, 1977, Ser. No. 791,164
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—14

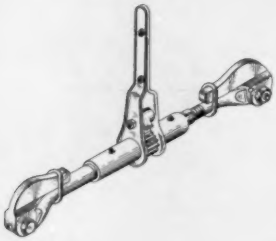
252,553
SURFACE-CLEANING APPARATUS
Paul Dummermuth, Zunzgen, Switzerland, assignor to Maschinenfabrik Von Arx AG, Sissach, Switzerland
Filed Jan. 14, 1977, Ser. No. 759,269
Claims priority, application Switzerland, Oct. 8, 1976, 63854/76
Term of patent 14 years
Int. Cl. D8—*05;* D15—*09*
U.S. Cl. D8—62



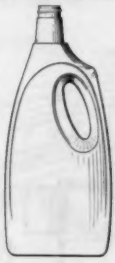
252,554
TOOL HANDLE
Robert W. Lancer, 3601 Kirby, Room 740, Houston, Tex. 77098
Filed Mar. 28, 1977, Ser. No. 782,305
Term of patent 14 years
Int. Cl. D8—*04*
U.S. Cl. D8—83



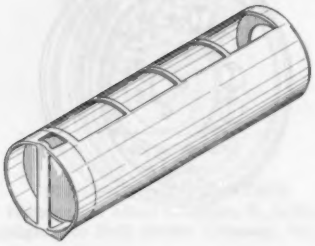
252,555
TELESCOPIC TURNBUCKLE
Kenneth D. Schreyer, Clarence, N.Y., assignor to Columbus McKinnon Corporation, Tonawanda, N.Y.
Filed Feb. 7, 1978, Ser. No. 875,781
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—355



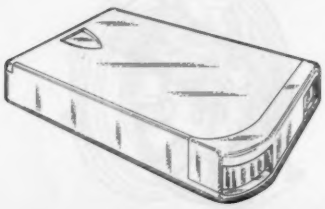
252,556
BOTTLE
Edward J. Kretz, Toledo, Ohio, assignor to Owens-Illinois, Inc.
Filed Apr. 14, 1977, Ser. No. 787,403
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—42



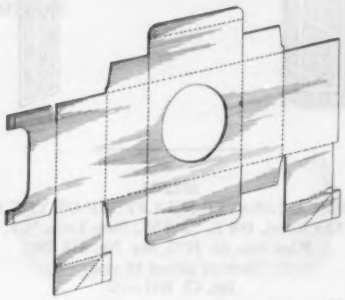
252,557
TONER CONTAINER
Marie E. Walker, Columbus, Ohio; John E. Forward, Penfield, N.Y.; Donald A. Robertson, Fairport, N.Y., and Frank Hacknauer, Palmyra, N.Y., assignors to Xerox Corporation, Stamford, Conn.
Filed Aug. 3, 1977, Ser. No. 821,389
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—216



252,558
CIGARETTE TROCHE HOLDER
Larry Beck, 7 Elm Ave., Kentfield, Calif. 94904
Filed Sep. 9, 1976, Ser. No. 722,301
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—224



252,559
CARTON BLANK
Robert A. Bliss, St. Paul, Minn., assignor to Champion International Corporation, Stamford, Conn.
Filed Apr. 22, 1977, Ser. No. 789,970
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—245



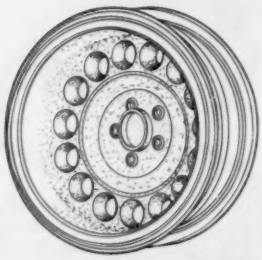
252,560
COMPASS-ROSE SCALE
Jonas Lönnroth, Stockholm, Sweden, assignor to Aktiebolaget Instrument Verken, Sollentun, Sweden
Filed Jun. 23, 1977, Ser. No. 809,275
Claims priority, application Sweden, Dec. 23, 1976, 2549/76
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—74

252,561
PENDANT
Alfred J. Durante, Forest Hills, N.Y., assignor to Cartier, Inc., New York, N.Y.
Filed Jun. 27, 1977, Ser. No. 810,073
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—79

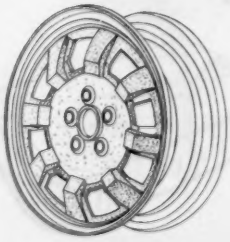
252,562
AMERICAN BEAVER SCULPTURE OR THE LIKE
John P. Van Koert, 190 E. 72nd St., New York, N.Y. 11209
Filed Sep. 23, 1977, Ser. No. 836,000
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—158

252,563
BEVERAGE SERVING CART
Edmund Vredenburg, Salt Lake City, Utah, assignor to Vredenburg Leisure Time Products, Salt Lake City, Utah
Filed Oct. 27, 1977, Ser. No. 846,274
Term of patent 14 years
Int. Cl. D12—*02*
U.S. Cl. D12—22

252,564
WHEEL
Millard F. Harty, Jr., 4881 Kensington Rd., Bloomfield Hills, Mich. 48013, assignor to Motor Wheel Corporation, Lansing, Mich.
Filed Oct. 7, 1977, Ser. No. 840,310
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—210



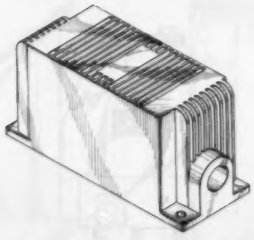
252,565
WHEEL
Russell O. Blanchard, Marshall, Mich., assignor to Motor Wheel Corporation, Lansing, Mich.
Filed Oct. 7, 1977, Ser. No. 840,306
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—211



252,566
WHEEL
Russell O. Blanchard, Marshall, Mich., assignor to Motor Wheel Corporation, Lansing, Mich.
Filed Oct. 7, 1977, Ser. No. 840,500
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—211

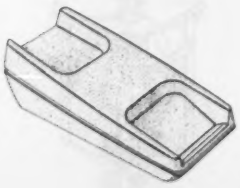
252,567
PENDENT HOIST CONTROL
Robert P. Harbage, and Albert L. Leffler, Jr., both of Charlotte, N.C., assignors to Duff Norton Company, Inc., Charlotte, N.C.
Filed Sep. 1, 1977, Ser. No. 829,805
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—38

252,568
HOUSING FOR ELECTRICAL CIRCUITS
Wilford K. Comstock, 8152 S. Danish Rd., Sandy, Utah 84070
Filed Jun. 22, 1977, Ser. No. 808,882
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—40

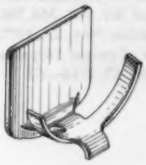


252,569
TELEPHONE STAND
Donald M. Genaro, Haworth, N.J.; John N. McGarvey, Drexel Hill, Pa., and Gordon E. Sylvester, Jamaica, N.Y., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Division of Ser. No. 604,592, Aug. 14, 1975, which is a continuation-in-part of Ser. No. 469,855, May 14, 1974, Pat. No. Des. 237,506, which is a continuation-in-part of Ser. No. 424,413, Dec. 13, 1973, abandoned, which is a continuation-in-part of Ser. No. 364,704, May 29, 1973, abandoned. This application Nov. 23, 1977, Ser. No. 854,469
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—60

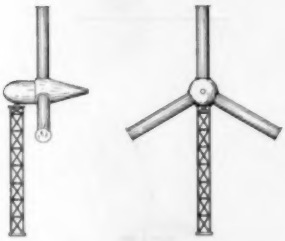
252,570
TELEPHONE STAND
Donald M. Genaro, Haworth, N.J.; John N. McGarvey, Drexel Hill, Pa., and Gordon E. Sylvester, Jamaica, N.Y., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Division of Ser. No. 604,592, Aug. 14, 1975, which is a continuation-in-part of Ser. No. 469,855, May 14, 1974, Pat. No. Des. 237,506, which is a continuation-in-part of Ser. No. 424,413, Dec. 13, 1973, abandoned, which is a continuation-in-part of Ser. No. 364,704, May 29, 1973, abandoned. This application Nov. 23, 1977, Ser. No. 854,160
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—60



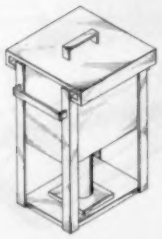
252,571
HANGER FOR TELEPHONE HANDSET
Ernest T. Hancock, 11034 N. 43rd Dr., Glendale, Ariz. 85304
Filed Sep. 26, 1977, Ser. No. 836,592
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—65



252,572
WIND TURBINE
Thomas F. Hanson, 24204 Heritage La., Newhall, Calif. 91321
Filed Jan. 31, 1977, Ser. No. 764,187
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D15—1

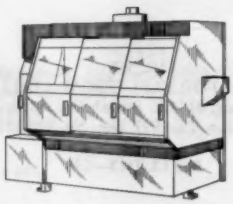


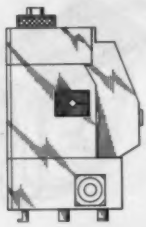
252,573
COMPACTOR
Kurt H. Weger, Box 3621, Lawrence, Kans. 66044
Filed Apr. 4, 1977, Ser. No. 784,862
Term of patent 14 years
Int. Cl. D23—*02*; D15—*99*
U.S. Cl. D15—123



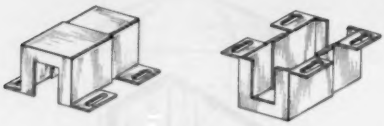
252,574
WEAR POINT FOR AGRICULTURAL FERTILIZER SHANK
Charles J. Clark, N. 6609 Washington, Spokane, Wash. 99208
Filed Feb. 28, 1977, Ser. No. 772,511
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D15—29

252,575
AUTOMATIC LATHE
Henry T. Simmons, Warwick, R.I., assignor to Brown & Sharpe Manufacturing Company, North Kingstown, R.I.
Filed Feb. 23, 1977, Ser. No. 771,154
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D15—130



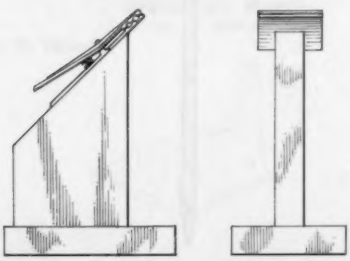


252,576
TELESCOPING GUARD FOR SHAFT COUPLING
Max Frey, Portland, Oreg., assignor to Crystal Lite Manufacturing Co.
Filed Feb. 28, 1977, Ser. No. 772,979
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D15—148

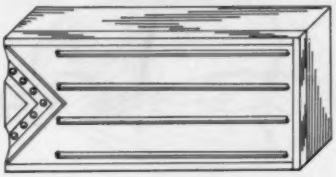


252,577
PEN
Norbert Leopoldi, 4180 Marine Dr., Chicago, Ill. 60613
Filed Dec. 30, 1977, Ser. No. 866,465
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—42

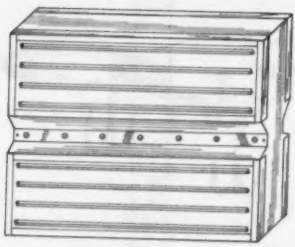
252,578
RECIPE CARD HOLDER OR SIMILAR ARTICLE
William P. Charowhas, 1097 La Cresta Blvd., El Cajon, Calif. 92021
Filed Mar. 25, 1977, Ser. No. 781,073
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—86



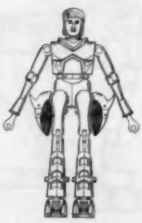
252,579
ILLUMINATED SIGN WITH CHANNELS FOR MOVEABLE CHARACTER PLATES
Ralph Kutschmende, 395 Manhattan Ave., Brooklyn, N.Y. 11211
Filed Nov. 15, 1977, Ser. No. 851,807
Term of patent 14 years
Int. Cl. D20—*03*
U.S. Cl. D20—10



252,580
ILLUMINATED SIGN WITH CHANNELS FOR MOVEABLE CHARACTER PLATES
Ralph Kutschmende, 395 Manhattan Ave., Brooklyn, N.Y. 11211
Filed Jan. 10, 1978, Ser. No. 868,468
Term of patent 14 years
Int. Cl. D20—*03*
U.S. Cl. D20—10

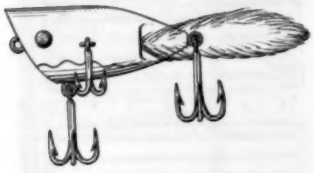


252,581
ARTICULATED TOY FIGURE
Iwakichi Ogawa, Kashiwa, Japan, assignor to Takara Co., Ltd., Tokyo, Japan
Filed Feb. 2, 1978, Ser. No. 874,542
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—177

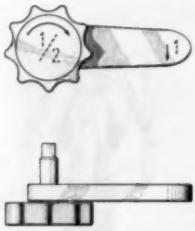


252,582
TENT
Lloyd H. Rain, Lexington, Ky., assignor to Irvin Industries Inc., Stamford, Conn.
Filed Jun. 17, 1977, Ser. No. 807,700
Term of patent 14 years
Int. Cl. D21—*04*
U.S. Cl. D21—253

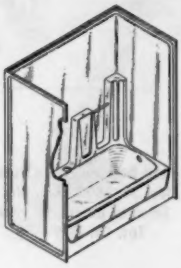
252,583
FISHING PLUG
David R. Shelton, 212 Virginia Ave., Crewe, Va. 23930
Filed Aug. 31, 1977, Ser. No. 829,582
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—27



252,584
TOILET FLUSH HANDLE
Zeev Raz, Keren Hayessod Str.17, Beer Sheva, Israel
Filed Jun. 29, 1977, Ser. No. 810,988
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—29

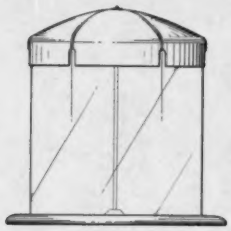


252,585
COMBINED BATHTUB AND SHOWER STALL
William E. Clow, Los Alamitos, Calif., assignor to Kimstock, Inc., Santa Ana, Calif.
Filed Oct. 28, 1977, Ser. No. 846,597
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—49

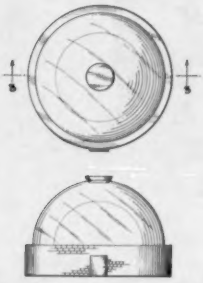


252,586
SEROLOGICAL PIPETTE
Thomas L. Kovach, 51 Mimosa Dr., Centerville, Ohio 45459
Filed Jul. 5, 1977, Ser. No. 813,115
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—55

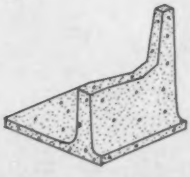
252,587
GREENHOUSE
William B. Darwin, Colorado Springs, Colo., assignor to Plant Site, Inc.
Filed Oct. 17, 1977, Ser. No. 843,131
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—15



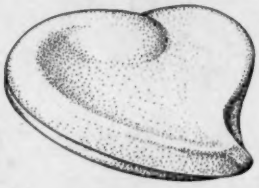
252,588
AQUARIUM BUILDING
James F. Spinner, 2436 Irving St. SE., Washington, D.C. 20020
Filed Jul. 8, 1977, Ser. No. 813,964
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—19



252,589
PAVING STONE
Keith Muller, 73 Bamoral Ave.; Michael Stewart, 79 South Dr., and Stanley Kochen, 789 Queen St. West, all of Toronto, Ontario, Canada
Filed Jul. 14, 1977, Ser. No. 815,747
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—80

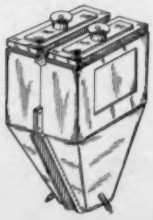


252,590
COSMETIC CONTAINER
Elsa Peretti, Barcelona, Spain, and Max Factor & Co., legal representative, 1655 North McCadden Pl., Hollywood, Calif. 90028
Filed Jul. 18, 1977, Ser. No. 816,304
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—80

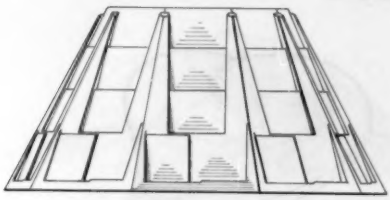


252,591
BIRD FEEDER
Donald B. Hyde, Jr., Stow, Mass., assignor to Hyde Bird Feeder Company, Waltham, Mass.
Filed Aug. 23, 1978, Ser. No. 936,254
Term of patent 14 years
Int. Cl. D30—*03*
U.S. Cl. D30—1 A

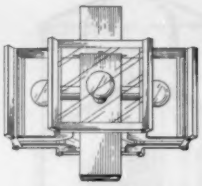
252,592
PIG WATERER
Lyle W. Lage, Gladbrook, Iowa 50635
Filed Sep. 1, 1978, Ser. No. 939,139
Term of patent 14 years
Int. Cl. D30—*03*
U.S. Cl. D30—15



252,593
LAMP SHADE
Paul Hilsdale, 1105 Armada Dr., Pasadena, Calif. 91103
Filed Apr. 11, 1977, Ser. No. 786,288
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—16 R



252,594
LIGHT FIXTURE
Fredrick R. Glassman, 9170 La Alba, Whittier, Calif. 90605
Filed Jun. 2, 1977, Ser. No. 802,986
The portion of the term of this patent subsequent to Oct. 26, 1990, has been disclaimed.
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—23 R



252,595
CARRIER FOR A PAIR OF ICE SKATES
Ronald G. Rogers, 4421 Hazelbrook Ave., Long Beach, Calif. 90808
Filed Jun. 27, 1977, Ser. No. 810,062
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D3—36

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 7TH DAY OF AUGUST, 1979

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. H. Robins Company, Inc.: *See—*
Franko, Bernard V.; and Proakis, Anthony G., 4,163,790, Cl. 424-267.000.

A.P.T., Inc.: *See—*
Calvert, Seymour, 4,163,649, Cl. 55-99.000.

A. Rela s/a Industria e Comercio: *See—*
Rella, Hermogenes, 4,163,492, Cl. 206-380.000.

Abe, Akira, to Sony Corporation. Tape cassette. 4,163,533, Cl. 242-198.000.

Acampora, Anthony; Reudink, Douglas O.; and Yeh, Yu S., to Bell Telephone Laboratories, Incorporated. Method and apparatus for effecting communication with receivers disposed in blackout regions formed by concurrently transmitted overlapping global and spot beams. 4,163,942, Cl. 325-52.000.

ACF Industries, Incorporated: *See—*
Fowler, James M.; and Morrison, Bertram L., 4,163,544, Cl. 251-328.000.
Hammonds, James C., 4,163,583, Cl. 406-198.000.

Acme-Cleveland Corporation: *See—*
Ramunas, Valdas S., 4,163,514, Cl. 226-141.000.

Acres, Gary J. K.; and Darling, Alan S., to Johnson, Matthey & Co., Limited. Method of producing platinum-clad articles. 4,163,736, Cl. 252-466.0PT.

Adams, John H., to Chevron Research Company. Synergistic combinations of hydrated potassium borate, antiwear agents, and organic sulfide antioxidants. 4,163,729, Cl. 252-18.000.

Adcock, Gerald L. Self aligning impact rock drilling tool. 4,163,478, Cl. 175-92.000.

AG fur Automatisierung: *See—*
Meili, Max, 4,163,345, Cl. 51-33.00W.

Agency of Industrial Science & Technology: *See—*
Ikari, Yoshikatsu; Yokoyama, Shiyoichiro; and Katoh, Keisuke, 4,163,715, Cl. 210-28.000.

Ahn, Byung K.: *See—*
Kuo, Han C.; Geren, George W.; Corvin, Thomas E.; and Ahn, Byung K., 4,163,698, Cl. 204-1.00T.

Aihara, Shigenobu; Haga, Isao; and Mizumura, Motoo, to Nippon Electric Co., Ltd. Frequency discriminator producing at least one of two pulse sequences representing in average the result of frequency discrimination. 4,163,951, Cl. 331-1.00A.

Air Industrie: *See—*
Garcin, Felix; and Weil, Marcel, 4,163,520, Cl. 239-707.000.

Aisin Seiki Kabushiki Kaisha: *See—*
Kagata, Toyota, 4,163,486, Cl. 192-35.000.

Akaba, Hayao; and Takeuchi, Takuzo, to Hoya Lens Corporation. Drilling machine. 4,163,622, Cl. 408-27.000.

Akazawa, Susumu; Murakami, Kyoichi; Ishihata, Kiyoshi; and Tsuchiya, Takao, to Sony Corporation. Detector circuit for color television receivers. 4,163,989, Cl. 358-27.000.

A.G. fur industrielle Elektronik AGIE Losone b. Locarno: *See—*
Buhler, Ernst; and Tadini, Costantino, 4,163,887, Cl. 219-69.00P.

Albe S.A.: *See—*
Buzzi, Ugo, 4,163,379, Cl. 72-121.000.

Alberts, Steven L., to GTE Sylvania Incorporated. Noise-immune master timing generator. 4,163,946, Cl. 328-63.000.

Alcohol Countermeasure Systems Inc.: *See—*
VanderSyde, Gary L.; and Warberg, John, 4,163,383, Cl. 73-27.00R.

Alexandrov, Vladimir A.: *See—*
Bykhovsky, David G.; Alexeev, Konstantin P.; Kunin, Viktor S.; Vassin, Valery M.; Nesterov, Valentin N.; Alexandrov, Vladimir A.; and Fomin, Eduard R., 4,163,402, Cl. 82-1.00C.

Alexeev, Konstantin P.: *See—*
Bykhovsky, David G.; Alexeev, Konstantin P.; Kunin, Viktor S.; Vassin, Valery M.; Nesterov, Valentin N.; Alexandrov, Vladimir A.; and Fomin, Eduard R., 4,163,402, Cl. 82-1.00C.

Allied Chemical Corporation: *See—*
Armor, John N., 4,163,756, Cl. 260-566.00A.
Nienart, Louis F.; Sellers, Gregory J.; Bretts, Gerald R.; and Timan, Dirk A., 4,163,821, Cl. 428-245.000.
Stephenson, Robert L.; Fox, William R.; and Gavagan, James A., 4,163,880, Cl. 200-61.58B.
Van der Mey, John E.; and Kremers, Frank J., 4,163,751, Cl. 260-457.000.

Allinquant, Fernand M.; and Allinquant, Jacques G. Pneumatic springs and other telescopic systems. 4,163,970, Cl. 340-686.000.

Allinquant, Jacques G.: *See—*
Allinquant, Fernand M.; and Allinquant, Jacques G., 4,163,970, Cl. 340-686.000.

Almand, John Z., III; Benner, Henry F.; and Reichenecker, William J., to Westinghouse Electric Corp. Electrical connection between aluminum conductors. 4,163,869, Cl. 174-94.00R.

Almasi, George S.; and Lin, Yeong S., to International Business Machines Corporation. Contiguous element field access bubble lattice file. 4,164,026, Cl. 365-3.000.

Almgren, Bertil: *See—*
Gunne, Ingemar; and Almgren, Bertil, 4,163,500, Cl. 215-260.000.

Alumax Mill Products, Inc.: *See—*
Pearson, Kenneth R., 4,163,665, Cl. 75-143.000.

AM International, Inc.: *See—*
Armstrong, Joel D., 4,163,550, Cl. 271-274.000.

Amer, Nabil M., to United States of America, Energy. Method and apparatus for optoacoustic spectroscopy. 4,163,382, Cl. 73-24.000.

Amerace Corporation: *See—*
Mayer, Robert W.; and Smorzaniuk, Adam, 4,163,879, Cl. 200-11.0TW.

American Cyanamid Company: *See—*
Corver, Hans A.; and Robertson, Allan J., 4,163,820, Cl. 428-212.000.
Fetchin, John A.; and Marzluff, William F., 4,163,735, Cl. 252-443.000.
Matsuda, Ken; Butensky, Martin S.; Tsu, Kin H.; and Munch, Robert J., 4,163,755, Cl. 260-561.00N.
Porosoff, Harold, 4,163,770, Cl. 264-210.300.

American District Telegraph Company: *See—*
Enemark, Robert B., 4,163,969, Cl. 340-630.000.

American Flange & Manufacturing Co. Inc.: *See—*
Dwinell, Davis B., 4,163,512, Cl. 222-525.000.

Amneus, John S., to Procter & Gamble Company, The. Squeeze dispenser with self closing valve. 4,163,509, Cl. 222-95.000.

AMP Incorporated: *See—*
Bianchi, Edward A.; and Huber, John H., 4,163,598, Cl. 339-107.000.

Ampex Corporation: *See—*
Ravizza, Raymond F., 4,163,993, Cl. 360-10.000.

Analogic Corporation: *See—*
Weedon, Hans J., 4,163,947, Cl. 328-128.000.

Anderson, Carl L.: *See—*
Kamath, G. Sanjiv; and Anderson, Carl L., 4,163,987, Cl. 357-30.000.

Anderson, Jeannette M.: *See—*
Anderson, Robert L.; and Anderson, Jeannette M., 4,163,998, Cl. 362-358.000.

Anderson, Robert L.; and Anderson, Jeannette M. Lampshade having picture display window. 4,163,998, Cl. 362-358.000.

Andros, Inc.: *See—*
Burough, Irvin G., 4,163,899, Cl. 250-343.000.

Angelbeck, Rolf; Gesell, Reinhard; and Sommer, Rudiger, to Dr. -Ing. Rudolf Hell GmbH, Firma. Recording electrode assembly for use in electrostatic reproduction. 4,163,980, Cl. 346-155.000.

Angenieux CLB S.A.: *See—*
Lauzier, Rene, 4,163,482, Cl. 188-24.000.

Anphar, S.A.: *See—*
Mauri, Jacinto M.; Vega-Noverola, Armando; and Spickett, Robert G. W., 4,163,789, Cl. 424-267.000.

Anthony, Thomas R.: *See—*
Cline, Harvey E.; Anthony, Thomas R.; and Giaever, Ivar, 4,163,983, Cl. 357-12.000.

Anton Steinecker Maschinenfabrik GmbH: *See—*
Wolfseder, Alfons, 4,163,417, Cl. 99-277.200.

Aoyama, Tetsuo: *See—*
Ikarashi, Takeo; Goto, Mikio; Sano, Kozo; Osaki, Naoto; Aoyama, Tetsuo; and Horie, Shigeru, 4,163,863, Cl. 568-798.000.

Arai, Atsuaki: *See—*
Shiba, Keisuke; Hirose, Takeshi; Arai, Atsuaki; Okumura, Akio; and Yokota, Yukio, 4,163,670, Cl. 96-74.000.

Archerd, Paul H., to Phillips Petroleum Company. Fractionation process and apparatus. 4,163,695, Cl. 203-18.000.

Argereu, William. Feed tube bushing. 4,163,403, Cl. 82-38.00A.

Armor, John N., to Allied Chemical Corporation. Direct oximation of ketones. 4,163,756, Cl. 260-566.00A.

Armstrong, Joel D., to AM International, Inc. Pressure roller assembly. 4,163,550, Cl. 271-274.000.

Arndt, Friedrich; Kruger, Hans-Rudolf; and Rusch, Reinhart, to Schering Aktiengesellschaft. 1,2,3-Thiadiazole-5-yl-urea derivatives, process for making the same and plant retardation and defoliation composition containing same. 4,163,658, Cl. 71-73.000.

Arthur G. McKee & Company: *See—*
Wong, Wang-Mo, 4,163,696, Cl. 203-44.000.

Asai, Kiyotsugu; Takaguchi, Kazunori; Kawabata, Toshihiko; Yatsugi, Shigeru; and Ichikawa, Toshiyuki, to Mitsui-Nisso Corporation. Method of coating glass bottle with aqueous dispersed urethane composition. 4,163,814, Cl. 427-372.00R.

ASEA Aktiebolag: *See—*
Hellgren, Keijo E., 4,163,378, Cl. 72-63.000.

Atlantic Richfield Company: *See—*
Baillie, Lloyd A., 4,163,711, Cl. 208-161.000.
Burk, Emmett H.; Yoo, Jin S.; Karch, John A.; and Sun, Jui-Yuan, 4,163,709, Cl. 208-120.000.
Burk, Emmett H.; Yoo, Jin S.; Karch, John A.; and Sun, Jui-Yuan, 4,163,710, Cl. 208-120.000.

Audesse, Emery G.; and Hartman, Donald W., to GTE Sylvania Incorporated. Multilamp photoflash unit. 4,164,007, Cl. 362-13.000.

Auge, Wolfgang: *See—*
Schroeder, Bernd; Braden, Rudolf; Auge, Wolfgang; Thiem, Karl-Werner; and Neeff, Rutger, 4,163,747, Cl. 260-378.000.

Aujla, Sharanjit S., to International Telephone and Telegraph Company. Electrical connector. 4,163,594, Cl. 339-82.000.

Austin, Leonard H. Method and apparatus for filling capsules. 4,163,354, Cl. 53-436.000.

Austin, Reginald G., to Westland Aircraft Limited. Unmanned multimode helicopter. 4,163,535, Cl. 244-17.230.

Auto Systems Limited: *See—*
Brook, Richard M., 4,163,488, Cl. 198-504.000.

Avco Corporation: *See—*
Kent, Peter, 4,163,366, Cl. 60-226.00R.

Averett, James E., Jr. Hip prosthesis. 4,163,292, Cl. 3-1.913.

Awofolu, Duke L. Reading table. 4,163,539, Cl. 248-452.000.

Ayer, Donald E., to Upjohn Company, The. 7a-Homo-4-oxo-PGI$_1$ compounds. 4,163,843, Cl. 542-426.000.

Aysta, James E.; and Goff, Dewain R., to Minnesota Mining and Manufacturing Company. Electrical connector. 4,163,596, Cl. 339-97.00P.

Azam, Guy; Bensussan, Andre; Gallet, Jean-Baptiste; and Tran, Duc Tien, to CGR-MeV. Compact irradiation apparatus using a linear charged-particle accelerator. 4,163,901, Cl. 250-401.000.

B. J. Hughes Inc.: *See—*
Sheldon, Loren B.; and Kelly, Robert R., 4,163,401, Cl. 81-57.340.

Baba, Takashi; Kawaguchi, Hiroshi; and Nishikawa, Kohji, to Toyota Jidosha Kogyo Kabushiki Kaisha. Automatic clearance adjusting mechanism in a brake. 4,163,483, Cl. 188-71.800.

Babcock & Wilcox Company, The: *See—*
Jabsen, Felix S., 4,163,690, Cl. 176-78.000.
Johnsen, Arne A.; and Kakarala, Chandrasekhara R., 4,163,470, Cl. 165-70.000.

Bachman, Joseph L., Jr.; Ginther, George E., Sr.; and Johnson, A. David, Jr., to Wayne Automation Corp. Method of erecting flat folded cases. 4,163,414, Cl. 93-53.00M.

Bachmann, Lothar. Device for sealing a conduit against the flow of liquid. 4,163,458, Cl. 137-240.000.

Baillie, Lloyd A., to Atlantic Richfield Company. Chemical conversion method. 4,163,711, Cl. 208-161.000.

Baker, Harris M., Jr., to Du Pont de Nemours, E. I., and Company. Liquid formulations of 1-(3,4-dichlorophenyl)-3-methoxy-3-methylurea and selected chloroacetamides. 4,163,662, Cl. 71-120.000.

Barber, Gerald L. Vehicle, especially amusement vehicle. 4,163,567, Cl. 280-208.000.

Barr-Mullin, Inc.: *See—*
Cunningham, John P., 4,163,321, Cl. 33-1.00S.

Barratt, Thomas R., to Sundstrand Corporation. Motor protector mount. 4,163,913, Cl. 310-91.000.

Barrows, Robert E.: *See—*
Kaseta, Robert G.; Daugherty, Lenn; Hinlein, Sigmund; Feldstein, Michael; Thackaberry, Harold; and Barrows, Robert E., 4,163,996, Cl. 360-97.000.

Bartel, William J.: *See—*
Cha, Chang Y.; and Bartel, William J., 4,163,475, Cl. 166-251.000.

Barth, Otto; Becker, Hans-Joachim; Behre, Horst; Kaiser, Reinhard; Steffan, Guido; and Zander, Jurgen, to Bayer Aktiengesellschaft. Process for the preparation of aminonaphthalenesulphonic acids. 4,163,752, Cl. 260-508.000.

BASF Wyandotte Corporation: *See—*
Inks, Clyde G., 4,163,727, Cl. 252-8.55C.

Baslow, Floyd M. Adapter for standard electrical wall fixtures. 4,163,882, Cl. 200-296.000.

Basterfield, Ernest P. Flushing cistern. 4,163,293, Cl. 4-3.000.

Batchelder, J. Samuel: *See—*
Koslow, Evan E.; and Batchelder, J. Samuel, 4,163,657, Cl. 71-27.000.

Battelle Development Corporation: *See—*
Harmer, Alan L., 4,163,397, Cl. 73-800.000.

Batterton, Elmo L.; and Lonsdale, Melvin J., to Meyer Morton Co. Erection means for a transport trailer. 4,163,626, Cl. 414-469.000.

Bauer, Jackson, to Collins & Aikman Corporation. Process for the sublimation transfer dyeing of textile materials including subsequent conductive heading. 4,163,642, Cl. 8-2.50A.

Bauer, Kurt; and Steuer, Werner, to Haarmann & Reimer Gesellschaft mit beschrankter Haftung. Process for preparing aromatic hydroxyaldehydes. 4,163,759, Cl. 260-600.00A.

Bayer Aktiengesellschaft: *See—*
Barth, Otto; Becker, Hans-Joachim; Behre, Horst; Kaiser, Reinhard; Steffan, Guido; and Zander, Jurgen, 4,163,752, Cl. 260-508.000.
Giesecke, Henning; Hocker, Jurgen; and Merten, Rudolf, 4,163,857, Cl. 548-318.000.
Schroeder, Bernd; Braden, Rudolf; Auge, Wolfgang; Thiem, Karl-Werner; and Neeff, Rutger, 4,163,747, Cl. 260-378.000.
Windemuth, Erwin; Dahm, Manfred; Dietrich, Manfred; and Muller, Peter, 4,163,830, Cl. 521-111.000.
Wolfers, Heinrich; Rudolph, Hans; and Rosenkranz, Hans-Jurgen, 4,163,865, Cl. 568-640.000.

BBC Brown, Boveri & Company Limited: *See—*
Frutschi, Hansulrich, 4,163,365, Cl. 60-39.030.

Beatrice Foods Co.: *See—*
Meyer, Robert H.; Graham, Charles I.; Rudolph, John E.; and Haas, Robert E., 4,163,804, Cl. 426-315.000.

Beaufort Air Sea Equipment Limited: *See—*
Neumark, Otto W., 4,163,297, Cl. 5-446.000.

Becker, Hans-Joachim: *See—*
Barth, Otto; Becker, Hans-Joachim; Behre, Horst; Kaiser, Reinhard; Steffan, Guido; and Zander, Jurgen, 4,163,752, Cl. 260-508.000.

Beckman Instruments, Inc.: *See—*
Corwin, William C., 4,163,738, Cl. 260-29.6ME.

Bedard, Victor. Load anchoring systems for flatbed. 4,163,425, Cl. 105-366.00C.

Been, Karl, to Oil-Dri Corporation of America. Process for making a synthetic liquid absorbent and products resulting therefrom. 4,163,674, Cl. 106-15.050.

Behre, Horst: *See—*
Barth, Otto; Becker, Hans-Joachim; Behre, Horst; Kaiser, Reinhard; Steffan, Guido; and Zander, Jurgen, 4,163,752, Cl. 260-508.000.

Bell, Dennis M., to International Tapetronics Corporation. Optical seed sensor for a seed planter monitor. 4,163,507, Cl. 221-2.000.

Bell Telephone Laboratories, Incorporated: *See—*
Acampora, Anthony; Reudink, Douglas O.; and Yeh, Yu S., 4,163,942, Cl. 325-52.000.
Di Domenico, Mauro, Jr.; Singh, Shobha; and Van Uitert, Legrand G., 4,163,982, Cl. 357-2.000.
Dubnowski, John J.; and Rosenberg, Aaron E., 4,164,025, Cl. 364-900.000.
Hartwell, Walter T.; Hinshaw, David L.; Hoffner, Charles W., II; and Toy, Wing N., 4,164,041, Cl. 365-238.000.

Beltek Corporation: *See—*
Sugihara, Masanori, 4,163,997, Cl. 360-137.000.

Bendix Corporation, The: *See—*
Koenig, James P., 4,163,584, Cl. 303-7.000.

Benedek, Eva: *See—*
Harsanyi, Kalman; Takacs, Kalman; Kiss, Pal; Szekeres, Laszlo; Papp, Gyula; and Benedek, Eva, 4,163,786, Cl. 421-258.000.

Benner, Henry F.: *See—*
Almand, John Z., III; Benner, Henry F.; and Reichenecker, William J., 4,163,869, Cl. 174-94.00R.

Benscoter, Richard D., to Textron Inc. Transition fitting. 4,163,572, Cl. 285-121.000.

Bensussan, Andre: *See—*
Azam, Guy; Bensussan, Andre; Gallet, Jean-Baptiste; and Tran, Duc Tien, 4,163,901, Cl. 250-401.000.

Bergwerksverband GmbH: *See—*
Voss, Kurt H., 4,163,582, Cl. 406-12.000.

Bernhardt, Floyd V. Golf putter. 4,163,554, Cl. 273-80.00C.

Berteleau, Gerard R.: *See—*
Malassine, Bernard P.; Gautier, Jean-Claude C.; Chevalier, Sammy H.; and Berteleau, Gerard R., 4,163,740, Cl. 260-31.20N.

Bertin, George. Varied track advancement game mechanism. 4,163,556, Cl. 273-86.00H.

Beschke, Helmut; and Friedrich, Heinz, to Deutsche Gold- und Silber Scheideanstalt vormals Roessler. Process for the production of 3-methyl pyridine. 4,163,854, Cl. 546-251.000.

Betensky, Ellis I., to U.S. Precision Lens, Inc. Projection lens. 4,163,604, Cl. 350-226.000.

Bezard, Jean-Jacques; Jourdain, Charles-Henri; and Lalanne, Bruno, to Jaeger. Device for checking the level of a liquid in a tank. 4,163,391, Cl. 73-295.000.

Bianchi, Edward A.; and Huber, John H., to AMP Incorporated. Point-to-point miniature coax connector. 4,163,598, Cl. 339-107.000.

Biermans, Andreas J., to Stamicarbon, B.V. Process for separation of ammonia and carbon dioxide. 4,163,648, Cl. 55-70.000.

Bindicator Company: *See—*
Levine, Walter E., 4,163,917, Cl. 310-327.000.

Bird, Alfred J.; Priestley, Timothy M.; and Winterbottom, John M., to Johnson, Matthey & Co., Limited. Process for the hydrogenation of a vegetable oil. 4,163,750, Cl. 260-409.000.

Blackwell, Joseph T., III; Gupton, John T.; Miyazaki, Teruko U.; Nabors, James B.; and Pociask, Joseph R., to Ciba-Geigy Corporation. Process for the production of 2-alkyl- or cycloalkyl-4-methyl-6-hydroxypyrimidines. 4,163,848, Cl. 544-319.000.

Blakemore, Colin B., to Du Pont de Nemours, E. I., and Company. Piezoelectric moisture analyzers. 4,163,384, Cl. 73-29.000.

Blind, Roger A.; Saterbak, Robert T.; and Wolfe, Edward I., to Exxon Research & Engineering Co. Removal of silica from mixed bed demineralizer. 4,163,717, Cl. 210-31.00R.

Blue Cross Laboratories: *See—*
Konigsbacher, Kurt S., 4,163,676, Cl. 106-243.000.

BOC Limited: *See—*
Smith, Kenneth C., 4,163,712, Cl. 210-7.000.

Bohn, Jack R.: *See—*
Pearson, Durk J.; and Bohn, Jack R., 4,163,580, Cl. 299-5.000.

Bonham, David W.: *See—*
Watson, Clifford A.; and Bonham, David W., 4,163,650, Cl. 55-126.000.

Bonnie, G. Patrick; and McGinnis, William J., Jr., to Control Data Corporation. Fault tolerant bubble memory with a single major loop having an integral stationary register. 4,164,027, Cl. 365-15.000.

Borona, Russell T.; and Coley, Kenneth R., to Westinghouse Electric Corp. Circuit breaker with thrust transmitting spring. 4,163,881, Cl. 200-153.00G.

Botsch, Bertram; and Marzluf, Werner, to Maschinenfabrik Hellmut Geiger. Lifting device for water, waste water, sludge and the like. 4,163,636, Cl. 415-6.000.

Boulanger, Henry J., to Texas Instruments Incorporated. Keyboard with illuminated keys. 4,163,883, Cl. 200-314.000.

Bouley, Etienne: *See—*
Hoffmann, Charles; and Bouley, Etienne, 4,163,785, Cl. 424-250.000.

Bowen, John G.: *See—*
Hauser, Stephen G.; and Bowen, John G., 4,163,895, Cl. 219-290.000.

Bowers, Wayne E., to Rolfite Company, The. Suspension of coal in fuel oils. 4,163,644, Cl. 44-51.000.

Bozzuto, Carl R.: *See—*
Matthews, Francis T.; and Bozzuto, Carl R., 4,163,910, Cl. 310-11.000.

Braden, Rudolf: *See—*
Schroeder, Bernd; Braden, Rudolf; Auge, Wolfgang; Thiem, Karl-Werner; and Neeff, Rutger, 4,163,747, Cl. 260-378.000.

Breidenbach, James H., to Steelcase Inc. Wiring access system for desks and the like. 4,163,867, Cl. 174-48.000.

Brenholts, Alfred R., to Stitt Spark Plug Company. Electrical connector for a spark plug. 4,163,597, Cl. 339-100.000.

Breslow, Jeffrey D.: *See—*
Jaworski, Eugene; and Breslow, Jeffrey D., 4,163,558, Cl. 273-115.000.

Bretts, Gerald R.: *See—*
Nienart, Louis F.; Sellers, Gregory J.; Bretts, Gerald R.; and Timan, Dirk A., 4,163,821, Cl. 428-245.000.

Brewerton, David, to Racal Instruments Limited. Electrical measurement and noise suppression. 4,163,940, Cl. 324-132.000.

Brigham Young University: *See—*
Pope, Bill J.; Horton, M. Duane; and Hall, H. Tracy, 4,163,769, Cl. 264-42.000.

British-American Tobacco Company Limited: *See—*
Green, John D.; and Harris, Ian R., 4,163,452, Cl. 131-10.00A.

British Petroleum Company Limited, The: *See—*
Foster, Alan I.; James, Peter G.; McCarroll, John J.; and Tennison, Stephen R., 4,163,775, Cl. 423-363.000.

Brook, Richard M., to Auto Systems Limited. Conveyor systems. 4,163,488, Cl. 198-504.000.

Brown, William R. Air charger. 4,163,772, Cl. 422-108.000.

Bruckner Apparatebau GmbH: *See—*
Schuierer, Manfred, 4,163,298, Cl. 8-151.000.

Brumley, Charles D.; and Staples, John M., to United States of America, Army. Recycle of spent acid in nitrolysis of hexamine to RDX. 4,163,845, Cl. 544-215.000.

Bryant, Charles P., to Lubrizol Corporation, The. Hydroxyalkyl hydroxy-aromatic condensation products as lubricant additives. 4,163,730, Cl. 252-34.700.

Bschorr, Oskar, to Messerschmitt-Bolkow-Blohm GmbH. Noise absorbing device. 4,163,479, Cl. 181-286.000.

Bube, Kenneth R.: *See—*
United States of America, National Aeronautics and Space Administration; and Bube, Kenneth R., 4,163,678, Cl. 136-89.0CC.

Buckman, John D.; Mercer, Gerald D.; and Pera, John D., to Buckman Laboratories, Inc. Synergistic compositions for corrosion and scale control. 4,163,733, Cl. 252-180.000.

Buckman Laboratories, Inc.: *See—*
Buckman, John D.; Mercer, Gerald D.; and Pera, John D., 4,163,733, Cl. 252-180.000.

Bud, Hans. Length measuring devices. 4,163,323, Cl. 33-141.00R.

Buhler, Ernst; and Tadini, Costantino, to A.G. fur industrielle Elektronik AGIE Losone b. Locarno. Pulse generator for electroerosive processing. 4,163,887, Cl. 219-69.00P.

Bundy, Gordon L., to Upjohn Company, The. Pyridylamides of nitriloprostacyclins. 4,163,841, Cl. 542-421.000.

Burk, Emmett H.; Yoo, Jin S.; Karch, John A.; and Sun, Jui-Yuan, to Atlantic Richfield Company. Catalyst demetallization by oxidation in a defined temperature range. 4,163,709, Cl. 208-120.000.

Burk, Emmett H.; Yoo, Jin S.; Karch, John A.; and Sun, Jui-Yuan, to Atlantic Richfield Company. Cracking process employing a combination of reductive and oxidative washes. 4,163,710, Cl. 208-120.000.

Burk, George A., to Dow Chemical Company, The. Stabilized aqueous amide antimicrobial composition. 4,163,795, Cl. 424-304.000.

Burk, George A., to Dow Chemical Company, The. Stabilized aqueous amide antimicrobial composition. 4,163,796, Cl. 424-304.000.

Burk, George A.; and Reineke, Charles E., to Dow Chemical Company, The. Stabilized aqueous amide antimicrobial composition. 4,163,797, Cl. 424-304.000.

Burk, George A.; Wilson, Charles A.; and Reineke, Charles E., to Dow Chemical Company, The. Stabilized aqueous amide antimicrobial composition. 4,163,798, Cl. 424-304.000.

Burkhart, L. Elkin; Fultz, Chester R.; and Maulden, Kerry A., to United States of America, Energy. Method for joining metal by solid-state bonding. 4,163,516, Cl. 228-114.000.

Burough, Irvin G., to Andros, Inc. Method and apparatus for gas analysis. 4,163,899, Cl. 250-343.000.

Burrig, Thomas, to U.S. Philips Corporation. Arrangement for examining objects. 4,163,991, Cl. 358-111.000.

Burroughs Corporation: *See—*
Nayland, William R., 4,163,995, Cl. 360-76.000.

Butensky, Martin S.: *See—*
Matsuda, Ken; Butensky, Martin S.; Tsu, Kin H.; and Munch, Robert J., 4,163,755, Cl. 260-561.00N.

Butler, Albert Q., to Dart Industries Inc. Fatigue resistant fittings and methods of fabrication. 4,163,561, Cl. 277-9.000.

Buzzi, Ugo, to Albe S.A. Apparatus for performing a working operation on the tip or point of a ball point pen. 4,163,379, Cl. 72-121.000.

B.V. Machinefabriek "Breda" voorheen Backer en Rueb: *See—*
Engelberts, Gerhardus A., 4,163,473, Cl. 165-157.000.

Bykhovsky, David G.; Alexeev, Konstantin P.; Kunin, Viktor S.; Vassin, Valery M.; Nesterov, Valentin N.; Alexandrov, Vladimir A.; and Fomin, Eduard R. Method of machining workpieces after preheating. 4,163,402, Cl. 82-1.00C.

Cafarelli, Ralph J. Ejection of molded materials. 4,163,540, Cl. 249-67.000.

Caldwell, Bessie L.: *See—*
Hinchman, Leslie R.; and Hinchman, Robert B., Sr., 4,163,632, Cl. 417-318.000.

California R & D Center: *See—*
Jones, Lawrence T.; Sims, Anson; Howden, Ashley G.; and Geery, Michael J., 4,163,341, Cl. 46-262.000.

Callen, Dennis M.; and Callen, Margo A. Cheese cake. 4,163,806, Cl. 426-582.000.

Callen, Margo A.: *See—*
Callen, Dennis M.; and Callen, Margo A., 4,163,806, Cl. 426-582.000.

Calvert, Seymour, to A.P.T., Inc. Collection of fine particles from a gas stream by moving the gas stream upward through a shallow bed of solid granules. 4,163,649, Cl. 55-99.000.

Campbell, Charles D., to Signet Optical Corporation. Mold for the casting of resin ophthalmic lenses having a prismatic segment. 4,163,541, Cl. 249-117.000.

Campbell, Charles D., to Signet Optical Corporation. Method of manufacture of molds for resin ophthalmic lenses having a segment with prismatic optical effect. 4,163,655, Cl. 65-17.000.

Canon Kabushiki Kaisha: *See—*
Ito, Yoshio; Tohyama, Yoshikuni; and Sagara, Seiji, 4,163,549, Cl. 271-174.000.
Komatsu, Toshiyuki; Takasu, Yoshio; Fujii, Motoharu; and Sugiura, Susumu, 4,163,892, Cl. 219-216.000.
Sakurada, Nobuaki; Mashimo, Yukio; Ito, Tadashi; Ito, Fumio; and Shinoda, Nobuhiko, 4,163,935, Cl. 324-29.500.

Capano, David: *See—*
Capano, Philip S.; and Capano, David, 4,163,408, Cl. 84-454.000.

Capano, Philip S.; and Capano, David. Musical tuning device. 4,163,408, Cl. 84-454.000.

Carlson, David E.; and Wronski, Christopher R., to RCA Corporation. Schottky barrier amorphous silicon solar cell with thin doped region adjacent metal Schottky barrier. 4,163,677, Cl. 136-89.0TF.

Carney, Richard W. J.; and de Stevens, George, to Ciba-Geigy Corporation. Tertiary aminoacids. 4,163,788, Cl. 424-267.000.

Carpenter, Roger C. Live bait insert apparatus. 4,163,336, Cl. 43-37.000.

Carrier Corporation: *See—*
Frye, Leonard V.; and Crossman, Robert F., 4,163,372, Cl. 62-259.000.

Carthage Cup Company: *See—*
Mannor, Arden, 4,163,508, Cl. 221-310.000.

Cassella Aktiengesellschaft: *See—*
Piesch, Steffen, 4,163,835, Cl. 528-254.000.

Caterpillar Tractor Co.: *See—*
Engel, William K., 4,163,368, Cl. 60-488.000.
Fisher, William P.; and Rosenberger, Paul C., 4,163,400, Cl. 74-710.000.
Fox, Lawrence E.; and Shuler, James R., 4,163,589, Cl. 305-14.000.
Grooss, Frank A.; and Simmons, Gerald P., 4,163,498, Cl. 414-697.000.
Hall, Gerald D.; and Swayze, Lloyd D., 4,163,628, Cl. 414-699.000.
Johnston, James E., 4,163,398, Cl. 74-483.00K.
Kennicutt, Robert B., 4,163,413, Cl. 91-521.000.
Nieman, John R.; and Sanders, S. David, 4,163,827, Cl. 428-377.000.
Powers, Harold C., 4,163,634, Cl. 417-499.000.

Centre Technique des Industries Mecaniques: *See—*
Schepacz, Charles, 4,163,701, Cl. 204-129.750.

CGR-MeV: *See—*
Azam, Guy; Bensussan, Andre; Gallet, Jean-Baptiste; and Tran, Duc Tien, 4,163,901, Cl. 250-401.000.

Cha, Chang Y.; and Bartel, William J., to Occidental Oil Shale, Inc. Determining the locus of a processing zone in an in situ oil shale retort. 4,163,475, Cl. 166-251.000.

Chamberlin, Thomas A.; and Madison, Norman L., to Dow Chemical Company, The. Complexing agents for phenolics. 4,163,718, Cl. 210-54.000.

Chambers Corporation: *See—*
Scherer, Richard M., 4,163,344, Cl. 49-386.000.
Scherer, Richard M., 4,163,894, Cl. 219-391.000.

Chambers, Ramon P.; Gordy, Robert S.; Sanders, David E.; and Morrison, Cameron E., to NCR Corporation. Compensation circuit for an electrical signal mixer. 4,163,944, Cl. 325-446.000.

Champion International Corporation: *See—*
Webinger, George, 4,163,518, Cl. 229-8.000.

Chemap AG: *See—*
Muller, Hans; and Sotirianos, Konstantin, 4,163,724, Cl. 210-323.00T.

Chemiefaser Lenzing Aktiengesellschaft: *See*—
Wimmer, Adalbert, 4,163,825, Cl. 428-368.000.

Chemische Werke Huls Aktiengesellschaft: *See*—
Kalka, Josef, 4,163,838, Cl. 528-501.000.

Chen, Tung C. System for reclaiming heat in a furnace arrangement. 4,163,441, Cl. 126-116.00A.

Cheng, William J.; and Guthrie, David B., to Petrolite Corporation. Organic liquids containing anti-static agents which are copolymers of alpha-olefins and maleic anhydrides reacted with amines. 4,163,645, Cl. 44-62.000.

Cheng, William J.; and Guthrie, David B., to Petrolite Corporation. Preparation of magnesium-containing dispersions from magnesium carboxylates at low carboxylate stoichiometry. 4,163,728, Cl. 252-18.000.

Chernov, Boris P.: *See*—
Lapy, Viktor J.; Chernov, Boris P.; Georgizon, Evgeny B.; Koshevoi, Anatoly A.; Yavorsky, Gerald I.; Glaziev, Valentin I.; Rivkin, Boris S.; Yakushenkov, Andrei A.; and Kurochkin, Sergei F., 4,163,972, Cl. 343-7.00A.

Cheseldine, David M., to Sprague Electric Company. Solid electrolyte capacitor, solderable terminations therefor and method for making. 4,164,005, Cl. 361-433.000.

Cheung, Mo-fung, to Ford Motor Company. Catalyzed polyisocyanate coating compositions. 4,163,815, Cl. 427-385.00R.

Chevalier, Sammy H.: *See*—
Malassine, Bernard P.; Gautier, Jean-Claude C.; Chevalier, Sammy H.; and Berteleau, Gerard R., 4,163,740, Cl. 260-31.20N.

Chevron Research Company: *See*—
Adams, John H., 4,163,729, Cl. 252-18.000.
Jacobson, Robert L.; and Gibson, K. R., 4,163,708, Cl. 208-89.000.
Turner, James H., 4,163,306, Cl. 28-254.000.

Chezek, Norman A.: *See*—
Kappler, Hermann; and Chezek, Norman A., 4,163,517, Cl. 229-45.000.

Chezem, Jimmie A. Door stop for inward opening door. 4,163,574, Cl. 292-338.000.

Chiba, Kensuke, to Sharp Rifle Co., Ltd. Apparatus for opening a delivery valve in a gas reservoir chamber of a compressed gas operated gun. 4,163,439, Cl. 124-70.000.

Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt.: *See*—
Feuer, Laszlo; Farkas, Lorand; Nogradi, Mihaly; Vermes, Borbala; Gottsegen, Agnes; and Wolfner, Andras, 4,163,746, Cl. 260-345.200.

Chinoin Pharmaceutical and Chemical Works Ltd.: *See*—
Harsanyi, Kalman; Takacs, Kalman; Kiss, Pal; Szekeres, Laszlo; Papp, Gyula; and Benedek, Eva, 4,163,786, Cl. 421-258.000.

Chiyoda Tsusho K.K.: *See*—
Yano, Kazuo, 4,163,573, Cl. 285-174.000.

Chiyomaru, Isao: *See*—
Jikihara, Kazuo; Itoh, Shigekazu; Takayama, Shuichi; Sato, Koichi; Kimura, Ichiro; and Chiyomaru, Isao, 4,163,661, Cl. 71-108.000.

Chloride Group Limited: *See*—
Foster, George W., 4,163,933, Cl. 320-20.000.

Christe, Karl O.; and Schack, Carl J., to United States of America, Navy. Self-clinkering burning rate modifier for solid propellant NF_3-F_2 gas generators for chemical HF-DF lasers. 4,163,773, Cl. 423-351.000.

Christe, Karl O.: *See*—
Schack, Carl J.; and Christe, Karl O., 4,163,774, Cl. 423-351.000.

Ciba-Geigy AG: *See*—
Keogh, Patrick J., 4,163,713, Cl. 210-22.00C.
Randell, Donald R.; Hyde, Thomas G.; Lamb, Frank; Clubley, Brian G.; and Phillips, William D., 4,163,731, Cl. 252-78.500.

Ciba-Geigy Corporation: *See*—
Blackwell, Joseph T., III; Gupton, John T.; Miyazaki, Teruko U.; Nabors, James B.; and Pociask, Joseph R., 4,163,848, Cl. 544-319.000.
Carney, Richard W. J.; and de Stevens, George, 4,163,788, Cl. 424-267.000.
Durr, Dieter, 4,163,791, Cl. 424-270.000.
Meyer, Willy; Drabek, Jozef; Gsell, Laurenz; and Karrer, Friedrich, 4,163,792, Cl. 424-272.000.

Cincinnati Milacron Inc.: *See*—
Matson, Charles B., 4,163,346, Cl. 51-165.770.

Cincinnati Mine Machinery Co., The: *See*—
Krekeler, Claude B., 4,163,581, Cl. 299-91.000.

Clark, Michael T.; and Ten Haken, Pieter, to Shell Oil Company. Use of certain thiophenecarbaldehyde phenylhydrazones as fungicides. 4,163,793, Cl. 424-275.000.

Clauder, Otto; Kiraly, Arpad; Kokosi, Jozsef; Karpati, Egon; and Szporny, Laszlo, to Richter Gedeon Vegyeszeti Gyar RT. 3α,16α-14,15-Dihydrocebumamenine. 4,163,851, Cl. 546-51.000.

Claunch, C. Kenneth, to Finish Engineering Company, Inc. Top-to-bottom mixer. 4,163,616, Cl. 366-262.000.

Cline, Harvey E.; Anthony, Thomas R.; and Giaever, Ivar, to General Electric Company. Solid state neuron. 4,163,983, Cl. 357-12.000.

Clubley, Brian G.: *See*—
Randell, Donald R.; Hyde, Thomas G.; Lamb, Frank; Clubley, Brian G.; and Phillips, William D., 4,163,731, Cl. 252-78.500.

Cobe Laboratories, Inc.: *See*—
Lobdell, Donn D., 4,163,721, Cl. 210-232.000.

Cochran, Michael J.; and Grant, Charles P., Jr., deceased (by Grant, Charles P., Sr., executor), to Texas Instruments Incorporated. Electronic calculator or microprocessor system having combined data and flag bit storage system. 4,164,037, Cl. 364-700.000.

Cogan, Fredrick T., to Northern Telecom Limited. Telephone handset with transmitter having a one piece gasket for sealing and holding of transmitter members. 4,163,875, Cl. 179-103.000.

Cogger, Michel: *See*—
Taylor, Frank, 4,163,472, Cl. 165-104.00R.

Coley, Kenneth R.: *See*—
Borona, Russell T.; and Coley, Kenneth R., 4,163,881, Cl. 200-153.00G.

Collins & Aikman Corporation: *See*—
Bauer, Jackson, 4,163,642, Cl. 8-2.50A.

Combustion Engineering, Inc.: *See*—
Matthews, Francis T.; and Bozzuto, Carl R., 4,163,910, Cl. 310-11.000.

Commonwealth Scientific and Industrial Research Organization: *See*—
Mamers, Heikki; and Rowney, John E., 4,163,687, Cl. 162-21.000.

Compagnie Europeenne pour l'Equipement Menager "CEPEM": *See*—
Gernez, Alain, 4,163,703, Cl. 204-181.00R.

Compagnie Francaise de Raffinage: *See*—
Michaux, Jean-Pierre, 4,163,697, Cl. 203-49.000.

Compagnie Industrielle des Telecommunications Cit-Alcatel: *See*—
Francois, Jacques; and Guillaumot, Georges, 4,164,002, Cl. 361-399.000.

Connecticut Research Institute, Inc.: *See*—
Warren, John B.; and Kundrath, Michael R., 4,163,900, Cl. 250-439.00R.

Connolly, John R.; Gibson, David E.; Heimark, Edward L.; Quinn, Jerome B.; Speechley, Richard E.; and Winter, Richard L., to Philadelphia Gear Corporation. Surface aerator impeller. 4,163,631, Cl. 416-185.000.

Consolidated Foods Corporation: *See*—
Kosik, John, 4,163,593, Cl. 339-15.000.

Continental Oil Company: *See*—
Kulik, Metro D.; and Gorin, Everett, 4,163,776, Cl. 423-567.000.

Contraves AG: *See*—
Heller, Rudolf; and Schattmaier, Kurt, 4,163,536, Cl. 248-118.000.

Control Data Corporation: *See*—
Bonnie, G. Patrick; and McGinnis, William J., Jr., 4,164,027, Cl. 365-15.000.

Cook, John E., to Fram Corporation. Air control valve. 4,163,543, Cl. 251-48.000.

Cooperman, Isadore; and Salkind, Morton. Freeze-thaw indicator apparatus. 4,163,427, Cl. 116-217.000.

Cordis Corporation: *See*—
Lesnick, Alan F.; and Tarjan, Peter P., 4,163,451, Cl. 128-419.0PG.

Corning Glass Works: *See*—
Kurth, Thomas C., 4,163,370, Cl. 65-2.000.
Olshansky, Robert, 4,163,601, Cl. 350-96.310.

Corver, Hans A.; and Robertson, Allan J., to American Cyanamid Company. Flame-retardant particleboard. 4,163,820, Cl. 428-212.000.

Corvin, Thomas E.: *See*—
Kuo, Han C.; Geren, George W.; Corvin, Thomas E.; and Ahn, Byung K., 4,163,698, Cl. 204-1.00T.

Corwin, William C., to Beckman Instruments, Inc. Washable non-splatter ink. 4,163,738, Cl. 260-29.6ME.

Cosentino, Louis C.; Seiler, Louis; and Helms, Richard A., to Renal Systems, Inc. Universal dialyzer end cap. 4,163,722, Cl. 210-236.000.

Coucher, Robert G., to W. R. Grace & Co. Container coating method. 4,163,812, Cl. 427-183.000.

County Commercial Cars Limited: *See*—
Tapp, Geoffrey E. E., 4,163,566, Cl. 280-91.000.

Covington, Wayne F.: *See*—
Olander, Emil E., Jr.; James, Rex L.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., 4,164,019, Cl. 364-710.000.
Olander, Emil E., Jr.; James, Rex L.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., 4,164,039, Cl. 364-709.000.

Cragoe, Edward J., Jr.; and Woltersdorf, Otto W., Jr., to Merck & Co., Inc. 3-Amino-N-[(phosphonoamino)iminomethyl]-6-halopyrazinecarboxamide compounds, compositions and methods of use. 4,163,781, Cl. 424-200.000.

Cragoe, Edward J., Jr.; and Woltersdorf, Otto W., Jr., to Merck & Co., Inc. 2,3-Dihydro-6,7-disubstituted-5-furoyl benzofuran-2-carboxylic acids. 4,163,794, Cl. 424-285.000.

Cramp, Harvey E.: *See*—
Kirk, Bryan W.; Raber, Monte B.; Hatch, Donald J.; and Cramp, Harvey E., 4,163,450, Cl. 128-145.800.

Crawford, Lynn D., to Hanscom, Genevieve I.; and Genevieve I. Hanscom, Robert M. Magnuson, Lois J. Thomson, Trustees of the Estate of Roy M. Magnus. Centering device for feeding articles to a food slicer. 4,163,406, Cl. 83-424.000.

Crawford, Wheeler C.: *See*—
Patterson, John A.; Crawford, Wheeler C.; and Wilson, James R., 4,163,761, Cl. 585-431.000.

Crisman, Thomas L.: *See*—
Moore, Stanley R.; Crisman, Thomas L.; and Zivney, Donald R., 4,163,374, Cl. 62-457.000.

Cromwell, Norman H.: *See*—
Edwards, William B., III; Secor, Henry V.; and Cromwell, Norman H., 4,163,856, Cl. 546-329.000.

Crossman, Robert F.: *See*—
Frye, Leonard V.; and Crossman, Robert F., 4,163,372, Cl. 62-259.000.

Crowe, John E.; and Shanley, John J., to Gould Advance Limited. Converter power supply apparatus. 4,164,014, Cl. 363-49.000.

Crown Zellerbach Corporation: *See*—
Stollberg, Ray H., 4,163,494, Cl. 206-423.000.

Cunningham, John P., to Barr-Mullin, Inc. Method for sequencing the cutting of elongated stock. 4,163,321, Cl. 33-1.00S.

Current, Wayne A., to Singer Company, The. Needle storage package. 4,163,493, Cl. 206-380.000.

Cutchaw, John M. Integrated circuit package and connector therefor. 4,164,003, Cl. 361-403.000.

Czirmai, Zoltan: *See*—
Kecskemethy, Geza; Virag, Gyorgy; Tihanyi, Robert; and Czirmai, Zoltan, 4,163,511, Cl. 222-144.500.

D/FW Plastics, Inc.: *See*—
McKinnon, Robert M., 4,163,503, Cl. 220-18.000.

Dahm, Manfred: *See*—
Windemuth, Erwin; Dahm, Manfred; Dietrich, Manfred; and Muller, Peter, 4,163,830, Cl. 521-111.000.

Dailing, James L., to Motorola, Inc. Monolithic crystal filter device. 4,163,959, Cl. 333-191.000.

Daiwa Seiko Inc.: *See*—
Egasaki, Takashi; and Kawai, Hiroshi, 4,163,528, Cl. 242-84.21R.

Dalibor, Horst, to Hoechst Aktiengesellschaft. Copolymer solution consisting of acrylic resin, process for its manufacture and the use thereof in reactive lacquers. 4,163,739, Cl. 260-31.20R.

Dalibor, Horst, to Hoechst Aktiengesellschaft. Process for the manufacture of soluble copolymers which contain hydroxyl groups and can be crosslinked with organic polyisocyanates. 4,163,836, Cl. 528-366.000.

Dalibout, Georges: *See*—
Limozin, Henri; and Dalibout, Georges, 4,163,587, Cl. 303-22.00R.

Dalke, Michael: *See*—
Miller, Garry E.; and Dalke, Michael, 4,164,008, Cl. 362-103.000.

Damm, Wendell W.; and Kim, Choong R., to Tektronix, Inc. Isolating differential amplifier. 4,163,950, Cl. 330-252.000.

Dana Corporation: *See*—
Guenther, William D.; and Mazziotti, Philip J., 4,163,438, Cl. 123-190.00A.

Darling, Alan S.: *See*—
Acres, Gary J. K.; and Darling, Alan S., 4,163,736, Cl. 252-466.0PT.

Dart Industries Inc.: *See*—
Butler, Albert Q., 4,163,561, Cl. 277-9.000.

Data General Corporation: *See*—
Kaseta, Robert G.; Daugherty, Lenn; Hinlein, Sigmund; Feldstein, Michael; Thackaberry, Harold; and Barrows, Robert E., 4,163,996, Cl. 360-97.000.

Daugherty, Lenn: *See*—
Kaseta, Robert G.; Daugherty, Lenn; Hinlein, Sigmund; Feldstein, Michael; Thackaberry, Harold; and Barrows, Robert E., 4,163,996, Cl. 360-97.000.

Davidov, Dan: *See*—
Shaltiel, David; Davidov, Dan; and Jacob, Isaac, 4,163,666, Cl. 75-177.000.

Davis, Manfred, to Transcience Industries, Inc. Supervised loop alarm radio transmitter system. 4,163,968, Cl. 340-539.000.

Davison, Fred E. Electric generating water power device. 4,163,905, Cl. 290-54.000.

Debourge, Jean-Claude: *See*—
Thizy, Andre; and Debourge, Jean-Claude, 4,163,782, Cl. 424-217.000.

Dechert, Roberta S., to S. C. Johnson & Son, Inc. Furniture polish emulsion. 4,163,673, Cl. 106-11.000.

Deeds, M. Rinley: *See*—
Fleenor, Richard P.; and Deeds, M. Rinley, 4,163,392, Cl. 73-421.00B.

Deere & Company: *See*—
Schnittjer, Bradley J.; and O'Neill, Michael J., 4,163,627, Cl. 414-686.000.

De Filippis, Giangrazio, to Texas Instruments Incorporated. Pneumatic or hydraulic pressure sensors with several thresholds of response. 4,163,964, Cl. 338-215.000.

Deindoerfer, Fred H.: *See*—
Harte, Richard A.; and Deindoerfer, Fred H., 4,163,779, Cl. 424-1.000.

Delaney, John H. Combination luggage protector and spotter. 4,163,484, Cl. 190-18.00R.

Delattre, Jacques; Raynaud, Roland; and Thomas, Claude, to Rhone-Poulenc-Textile. Process for obtaining dimethyl terephthalate from polyester scrap. 4,163,860, Cl. 560-96.000.

del Castillo, Juan M.: *See*—
Rumer, David O., Jr.; Findlay, Donald J.; Neumann, Arthur E.; and del Castillo, Juan M., 4,163,409, Cl. 84-484.000.

Denes, Jozsef; and Szokolay, Mihaly, to Szamitastechnikai Koordinacios Intezet. Reversible code compressor. 4,163,967, Cl. 340-347.0DD.

DePaolis, Potito U. Process for preparing an imitation mayonnaise and salad dressing. 4,163,808, Cl. 426-613.000.

de Stevens, George: *See*—
Carney, Richard W. J.; and de Stevens, George, 4,163,788, Cl. 424-267.000.

Deutsche Gold- und Silber Scheideanstalt vormals Roessler: *See*—
Beschke, Helmut; and Friedrich, Heinz, 4,163,854, Cl. 546-251.000.

de Vecchis, Michel: *See*—
Hulin, Jean-Pierre; and de Vecchis, Michel, 4,163,641, Cl. 425-461.000.

Devos, Francis; Leroy, Patrick; and Huchette, Michel, to Roquette Freres. Insoluble enzymatically active particles. 4,163,691, Cl. 435-174.000.

Diamantides, Nick D. Universal impedance power apparatus. 4,163,962, Cl. 335-222.000.

Diaz Chemical Corporation: *See*—
Pivawer, Philip M., 4,163,753, Cl. 260-544.00D.

DiCarlantonio, Norman L.; and Thiel, Jerome F. Decorative patch. 4,163,817, Cl. 428-33.000.

Di Domenico, Mauro, Jr.; Singh, Shobha; and Van Uitert, Legrand G., to Bell Telephone Laboratories, Incorporated. Solid state electrical switch employing electrochromic material. 4,163,982, Cl. 357-2.000.

Diesch, Robert E.; and Strunc, Gerald R., to Pako Corporation. Paper feed control for automatic photographic paper cutter. 4,163,405, Cl. 83-371.000.

Dietrich, Manfred: *See*—
Windemuth, Erwin; Dahm, Manfred; Dietrich, Manfred; and Muller, Peter, 4,163,830, Cl. 521-111.000.

Dillon, Michael J. Shell reloading machine. 4,163,410, Cl. 86-23.000.

Dipsol Chemicals Co., Ltd.: *See*—
Igarashi, Shuji; Fujisawa, Yoshikazu; and Igarashi, Toshio, 4,163,700, Cl. 204-43.00S.

Ditges, Gunter: *See*—
Windelbandt, Herbert; and Ditges, Gunter, 4,163,363, Cl. 59-27.000.

Dobson, Robert L., to Goodyear Tire & Rubber Company, The. Self-sealing pneumatic tire. 4,163,467, Cl. 152-347.000.

Dr. -Ing. Rudolf Hell GmbH, Firma: *See*—
Angelbeck, Rolf; Gesell, Reinhard; and Sommer, Rudiger, 4,163,980, Cl. 346-155.000.

Dogliotti, Amilcare, to P. Ferrero & C. S.p.A. Container for dispensing small objects. 4,163,496, Cl. 206-538.000.

Doguchi, Nobushige; and Hayashi, Moriyoshi, to Yoshida Kogyo K.K. Ceiling attachment apparatus. 4,163,350, Cl. 52-403.000.

Dohnalik, Joseph J., to Garden City Envelope Company. Paper chip collecting and compacting apparatus. 4,163,651, Cl. 55-344.000.

Dolhyj, Serge R.; and Milberger, Ernest C., to Standard Oil Company (Ohio). Preparation of unsaturated acids. 4,163,862, Cl. 562-534.000.

Dow Chemical Company, The: *See*—
Burk, George A., 4,163,795, Cl. 424-304.000.
Burk, George A., 4,163,796, Cl. 424-304.000.
Burk, George A.; and Reineke, Charles E., 4,163,797, Cl. 424-304.000.
Burk, George A.; Wilson, Charles A.; and Reineke, Charles E., 4,163,798, Cl. 424-304.000.
Chamberlin, Thomas A.; and Madison, Norman L., 4,163,718, Cl. 210-54.000.
Gessell, Donald E., 4,163,831, Cl. 526-153.000.
Groninger, Greg D., 4,163,371, Cl. 62-50.000.
Malhotra, Sudarshan K.; and Ricks, Michael J., 4,163,787, Cl. 424-263.000.
Rudd, John F., 4,163,762, Cl. 525-67.000.

Drabek, Jozef: *See*—
Meyer, Willy; Drabek, Jozef; Gsell, Laurenz; and Karrer, Friedrich, 4,163,792, Cl. 424-272.000.

Drader, Clarence H. Plastic bread carrier having folding end walls. 4,163,495, Cl. 206-506.000.

Dragunevicius, Algirdas J.: *See*—
Lenaerts, George V.; and Dragunevicius, Algirdas J., 4,163,874, Cl. 179-100.00R.

Drouin, Claude, to Les Industries BFG Limitee. Door for pyrolytic range. 4,163,444, Cl. 126-198.000.

D'Sidocky, Richard M., to Goodyear Tire & Rubber Company, The. Base modified catalysis in the styrenation of diphenylamine. 4,163,757, Cl. 260-570.00R.

Dubnowski, John J.; and Rosenberg, Aaron E., to Bell Telephone Laboratories, Incorporated. Spelled word input directory information retrieval system with input word error corrective searching. 4,164,025, Cl. 364-900.000.

Duda, Alex J. Portable golf ball washer. 4,163,299, Cl. 15-21.00A.

Duke, June T.; and Prem, Dorothy C., to Standard Oil Company, The. Impact-resistant olefinic-nitrile olefinic-ester copolymers prepared in the presence of an olefinic-ester copolymer elastomer. 4,163,766, Cl. 525-230.000.

Du Pont de Nemours, E. I., and Company: *See*—
Baker, Harris M., Jr., 4,163,662, Cl. 71-120.000.
Blakemore, Colin B., 4,163,384, Cl. 73-29.000.
MacDonald, Robert D.; Rose, Robert K.; and Papsdorf, John W., 4,163,474, Cl. 165-179.000.
Mansure, Jacob F., 4,163,742, Cl. 260-42.170.
Schmidt, Gunter, 4,163,499, Cl. 414-411.000.
Yates, Richard A., 4,163,692, Cl. 435-254.000.

Dupuis, Jean M., to Northern Telecom Limited. Contact pin feeding and orienting apparatus. 4,163,487, Cl. 198-383.000.

Durapipe Limited: *See*—
Nash, David D., 4,163,571, Cl. 285-106.000.

Durr, Dieter, to Ciba-Geigy Corporation. 2-Phenyliminothiazoline compounds. 4,163,791, Cl. 424-270.000.

Dwinell, Davis B., to American Flange & Manufacturing Co. Inc. Single use pouring spout and combination. 4,163,512, Cl. 222-525.000.

Dwyer, Gregory J.; and Kauffman, Ivan L., to Ex-Cell-O Corporation. Universal floating guide means. 4,163,590, Cl. 308-3.00R.

Dyment, John C.: *See—*
Springthorpe, Anthony J.; and Dyment, John C., 4,163,953, Cl. 331-94.50H.

Dynamic Sciences International, Inc.: *See—*
Griffith, Robert C., 4,164,020, Cl. 364-718.000.

Eastman Kodak Company: *See—*
Legras, Jean-Pierre; and Marechal, Claude M., 4,163,823, Cl. 428-304.000.
Smart, David C., 4,163,613, Cl. 354-198.000.

Eaton, Bradley C.; and Taylor, Thomas M., to Singer Company, The. Electronic output circuit for vacuum cleaners. 4,163,999, Cl. 361-23.000.

Eckert, Robert D.; Levy, Boris; and Mahoney, John B., to Polaroid Corporation. Novel method for forming silver diffusion transfer image receiving layers. 4,163,816, Cl. 427-401.000.

Eckle, Otto, to Komet Stahlhalter- und Werkzeugfabrik Robert Breuning GmbH. Toolholder for recessing operations, in particular a boring bar. 4,163,624, Cl. 408-185.000.

Edwards, John W., to Ginny Bee Harvester Corporation. Crop harvesting apparatus. 4,163,355, Cl. 56-328.00R.

Edwards, Robert A. Remote indicating solid state compass. 4,163,326, Cl. 33-361.000.

Edwards, Thomas M.: *See—*
Maguire, Justin M., Jr.; and Edwards, Thomas M., 4,164,009, Cl. 362-127.000.

Edwards, William B., III; Secor, Henry V.; and Cromwell, Norman H., to Philip Morris Incorporated. Azetidine compounds and process for production. 4,163,856, Cl. 546-329.000.

Edwards, William B., III: *See—*
Secor, Henry V.; and Edwards, William B., III, 4,163,855, Cl. 546-329.000.

Egasaki, Takashi; and Kawai, Hiroshi, to Daiwa Seiko Inc. Spinning reel. 4,163,528, Cl. 242-84.21R.

Eibl, Hansjorg; and Nicksch, Alfar, to Max-Planck-Gesellschaft zur Forderung der Wissenschaften E.V. Propane-1,3-diol phosphatides and method of preparing the same. 4,163,748, Cl. 260-403.000.

Eisai Co., Ltd.: *See—*
Morita, Eiichi; Ejiri, Hirosaburo; Takayanagi, Keizo; Morita, Yukio; Tanaka, Yasuhide; Kijima, Shizumasa; Hamamura, Kimio; and Yamatsu, Isao, 4,163,864, Cl. 568-628.000.

Ejiri, Hirosaburo: *See—*
Morita, Eiichi; Ejiri, Hirosaburo; Takayanagi, Keizo; Morita, Yukio; Tanaka, Yasuhide; Kijima, Shizumasa; Hamamura, Kimio; and Yamatsu, Isao, 4,163,864, Cl. 568-628.000.

Elast-O-Cor Products & Engineering Limited: *See—*
Macierewicz, Jacek J.; Richters, Johannes J.; and St. John, James E., 4,163,719, Cl. 210-84.000.

Electroplating Engineers of Japan, Ltd.: *See—*
Murata, Yasuyuki, 4,163,704, Cl. 204-206.000.

Elliott Bay Plywood Machines Co.: *See—*
Rock, Vincent M.; and Severinsen, Arne R., 4,163,491, Cl. 198-836.000.

Elser, William F., to Owens-Illinois, Inc. Metal end having fluted end curl. 4,163,504, Cl. 220-66.000.

Elsner, Georg; Heymer, Gero; and Stephan, Hans-Werner, to Hoechst Aktiengesellschaft. Continuous production of organic phosphines. 4,163,760, Cl. 260-606.50P.

EMI Limited: *See—*
Williams, Anthony M., 4,163,526, Cl. 242-54.00R.

Enemark, Robert B., to American District Telegraph Company. Variable frequency light pulser for smoke detectors. 4,163,969, Cl. 340-630.000.

Engel, William K., to Caterpillar Tractor Co. Centrifugal replenishing pump for a hydrostatic pump motor system. 4,163,368, Cl. 60-488.000.

Engelberts, Gerhardus A., to B.V. Machinefabriek "Breda" voorheen Backer en Rueb. Heat exchanger. 4,163,473, Cl. 165-157.000.

Enger, Phillip F.: *See—*
Gutierrez, Manuel; and Enger, Phillip F., 4,163,393, Cl. 73-584.000.

English, Alan, to Hanna Mining Company. Heat reclaim system. 4,163,469, Cl. 165-35.000.

Ernyei, Herbert; and Langlois, Etienne, to Societe Lignes Telegraphiques et Telephoniques. Electromechanical filter structure. 4,163,960, Cl. 333-198.000.

ESB Incorporated: *See—*
Schuchard, Walter F., 4,164,016, Cl. 363-88.000.

Espelage, Paul M.; and Walker, Loren H., to General Electric Company. Control circuit for power converter. 4,164,015, Cl. 363-87.000.

Etablissements Lachaussee, Societe Anonyme: *See—*
Lachaussee, Maurice, 4,163,930, Cl. 318-563.000.

Ettinger, Donald H., to USM Corporation. Stud welding tool. 4,163,888, Cl. 219-98.000.

Ex-Cell-O Corporation: *See—*
Dwyer, Gregory J.; and Kauffman, Ivan L., 4,163,590, Cl. 308-3.00R.

Exxon Research & Engineering Co.: *See—*
Blind, Roger A.; Saterbak, Robert T.; and Wolfe, Edward I., 4,163,717, Cl. 210-31.00R.
Horowitz, Harold S.; Longo, John M.; and Lewandowski, Joseph T., 4,163,706, Cl. 204-242.000.
Oswald, Alexis A., 4,163,832, Cl. 528-76.000.
Saidla, Glen E. W., 4,163,824, Cl. 428-313.000.

Ezra C. Lundahl, Inc.: *See—*
Lundahl, Ezra C.; and Wiser, J. Gordon, 4,163,524, Cl. 241-30.000.

Faessler, Rene: *See—*
Laflaquiere, Regis; Janousek, Rade; and Faessler, Rene, 4,163,304, Cl. 19-97.000.

Fales, David E., to Rainer Isolierrohrfabrik Max Drossbach. Corrugated drainage tubing with helically arranged drainage openings. 4,163,619, Cl. 405-49.000.

Famiano, Carl J.: *See—*
Garlington, Frank E.; and Famiano, Carl J., 4,163,956, Cl. 333-12.000.

Farkas, Lorand: *See—*
Feuer, Laszlo; Farkas, Lorand; Nogradi, Mihaly; Vermes, Borbala; Gottsegen, Agnes; and Wolfner, Andras, 4,163,746, Cl. 260-345.200.

Farrand Optical Co., Inc.: *See—*
La Russa, Joseph A., 4,163,542, Cl. 350-3.720.

Faulkner, Dennis T.: *See—*
Glennon, Timothy F.; Sarphie, Theodore E.; and Faulkner, Dennis T., 4,164,033, Cl. 364-431.000.
Glennon, Timothy F.; Sarphie, Theodore E.; and Faulkner, Dennis T., 4,164,034, Cl. 364-431.000.

Federal Paper Board Company, Inc.: *See—*
Ganz, Robert H., 4,163,352, Cl. 53-393.000.

Feldstein, Michael: *See—*
Kaseta, Robert G.; Daugherty, Lenn; Hinlein, Sigmund; Feldstein, Michael; Thackaberry, Harold; and Barrows, Robert E., 4,163,996, Cl. 360-97.000.

Feltex Limited: *See—*
Turnbull, Roy H., 4,163,716, Cl. 210-28.000.

Ferina, Ronald L. Orbital clock. 4,163,362, Cl. 58-126.00R.

Ferrand, Gerard; and Maffrand, Jean-Pierre, to Parcor. Process for the preparation of tetrahydro-thieno[3,2-c]- and [2,3-c]pyridine derivatives. 4,163,852, Cl. 546-114.000.

Fetchin, John A.; and Marzluff, William F., to American Cyanamid Company. Catalyst preparation method. 4,163,735, Cl. 252-443.000.

Feuer, Laszlo; Farkas, Lorand; Nogradi, Mihaly; Vermes, Borbala; Gottsegen, Agnes; and Wolfner, Andras, to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt. Metabolic 5-methyl-isoflavone-derivatives, process for the preparation thereof and compositions containing the same. 4,163,746, Cl. 260-345.200.

Fiber Associates, Inc.: *See—*
Geyer, Charles J., Jr.; and White, Ben E., 4,163,840, Cl. 536-101.000.

Fiber Controls Corporation: *See—*
Grice, Karl R., Jr., 4,163,927, Cl. 318-68.000.

Finch, David H. Illuminated bank window. 4,164,010, Cl. 362-147.000.

Findlay, Donald J.: *See—*
Rumer, David O., Jr.; Findlay, Donald J.; Neumann, Arthur E.; and del Castillo, Juan M., 4,163,409, Cl. 84-484.000.

Finish Engineering Company, Inc.: *See—*
Claunch, C. Kenneth, 4,163,616, Cl. 366-262.000.

Finn, Lawrence R.; McCartan, Daniel A.; and Schmandt, Gary M., to Owens-Corning Fiberglas Corporation. Method of packaging compressible fibrous batts. 4,163,353, Cl. 53-430.000.

Firmenich SA: *See—*
Strickler, Hugo, 4,163,866, Cl. 568-819.000.

Fisher, William F.; and Rosenberger, Paul C., to Caterpillar Tractor Co. Thrust washer construction for differential. 4,163,400, Cl. 74-710.000.

Fisons Limited: *See—*
Percival, Albert; and Judson, Philip N., 4,163,846, Cl. 544-262.000.

Fleenor, Richard P.; and Deeds, M. Rinley, to Manning Environmental Corp. Sampler purge system. 4,163,392, Cl. 73-421.00B.

Foedrowitz, Jurgen: *See—*
Semjonow, Valentin; and Foedrowitz, Jurgen, 4,163,305, Cl. 19-299.000.

Fogg, Lewis W.; Rauhala, Kenneth R.; Satterfield, H. Eugene; and Scott, Eion G., to General Electric Company. Controlled environment agriculture facility and method for its operation. 4,163,342, Cl. 47-58.000.

Fomin, Eduard R.: *See—*
Bykhovsky, David G.; Alexeev, Konstantin P.; Kunin, Viktor S.; Vassin, Valery M.; Nesterov, Valentin N.; Alexandrov, Vladimir A.; and Fomin, Eduard R., 4,163,402, Cl. 82-1.00C.

Fong, William, to National Research Development Corporation. Electric motors or generators. 4,163,915, Cl. 310-198.000.

Ford Motor Company: *See—*
Cheung, Mo-fung, 4,163,815, Cl. 427-385.00R.
Lambe, John J.; and McCarthy, Shaun L., 4,163,920, Cl. 313-503.000.

Forsyth, Bruce A.: *See—*
McGarry, Errol J.; and Forsyth, Bruce A., 4,163,801, Cl. 424-347.000.

Foster, Alan I.; James, Peter G.; McCarroll, John J.; and Tennison, Stephen R., to British Petroleum Company Limited, The. Process for the synthesis of ammonia using catalysts supported on graphite containing carbon. 4,163,775, Cl. 423-363.000.

Foster, George W., to Chloride Group Limited. Automatic electric battery charging apparatus. 4,163,933, Cl. 320-20.000.

Foundation for the Study of Asthma and Related Diseases, The: *See—*
Ohman, John L.; and Lowell, Francis C., 4,163,778, Cl. 424-91.000.

Fowler, James M.; and Morrison, Bertram L., to ACF Industries, Incorporated. Two piece composite valve seal ring construction. 4,163,544, Cl. 251-328.000.

Fox, Lawrence E.; and Shuler, James R., to Caterpillar Tractor Co. Hinge joint for track link assemblies. 4,163,589, Cl. 305-14.000.

Fox, William R.: *See—*
Stephenson, Robert L.; Fox, William R.; and Gavagan, James A., 4,163,880, Cl. 200-61.58B.

Fram Corporation: *See*—
Cook, John E., 4,163,543, Cl. 251-48.000.
Francois, Jacques; and Guillaumot, Georges, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Connection assembly for interconnecting a circuit board and a frame. 4,164,002, Cl. 361-399.000.
Franko, Bernard V.; and Proakis, Anthony G., to A. H. Robins Company, Inc. Method for increasing coronary blood flow in mammals. 4,163,790, Cl. 424-267.000.
Fraser, Douglas S.: *See*—
Thompson, Taylor N.; and Fraser, Douglas S., 4,163,327, Cl. 34-5.000.
Freeze Sleeves of America, Inc.: *See*—
Moore, Stanley R.; Crisman, Thomas L.; and Zivney, Donald R., 4,163,374, Cl. 62-457.000.
Freimuth, Lothar: *See*—
Miller, Imrich; and Freimuth, Lothar, 4,163,531, Cl. 242-158.00R.
Friedrich, Heinz: *See*—
Beschke, Helmut; and Friedrich, Heinz, 4,163,854, Cl. 546-251.000.
Frutschi, Hansulrich, to BBC Brown, Boveri & Company Limited. Method for regulating a power plant containing a gas turbine assembly and apparatus for the performance of the aforesaid method. 4,163,365, Cl. 60-39.030.
Frye, Leonard V.; and Crossman, Robert F., to Carrier Corporation. Capillary retainer clip. 4,163,372, Cl. 62-259.000.
FTS Systems, Inc.: *See*—
Thompson, Taylor N.; and Fraser, Douglas S., 4,163,327, Cl. 34-5.000.
Fugett, Albert. Gasoline miser. 4,163,436, Cl. 123-141.000.
Fuji Photo Film Co., Ltd.: *See*—
Inoue, Atsuo; and Mikami, Takeshi, 4,163,671, Cl. 96-74.000.
Shiba, Keisuke; Hirose, Takeshi; Arai, Atsuaki; Okumura, Akio; and Yokota, Yukio, 4,163,670, Cl. 96-74.000.
Fuji Xerox Co., Ltd.: *See*—
Ishii, Tetsuo, 4,163,898, Cl. 250-315.00R.
Fujii, Motoharu: *See*—
Komatsu, Toshiyuki; Takasu, Yoshio; Fujii, Motoharu; and Sugiura, Susumu, 4,163,892, Cl. 219-216.000.
Fujii, Toshikatsu: *See*—
Ishida, Nakao; Suzuki, Fujio; Maeda, Hiroshi; Fujii, Toshikatsu; and Mizutani, Ituro, 4,163,780, Cl. 424-116.000.
Fujisawa, Yoshikazu: *See*—
Igarashi, Shuji; Fujisawa, Yoshikazu; and Igarashi, Toshio, 4,163,700, Cl. 204-43.00S.
Fujishiro, Takeshi, to Nissan Motor Company, Limited. Air/fuel ratio control system for internal combustion engine having compensation means for variation in output characteristic of exhaust sensor. 4,163,433, Cl. 123-119.0EC.
Fujitaki, Roy K., to VSI Corporation. Right angle lock. 4,163,375, Cl. 70-134.000.
Fukuda, Shin: *See*—
Miki, Sukeichi; Ninomiya, Shuichi; Fukuda, Shin; and Sugimoto, Yukio, 4,163,943, Cl. 325-433.000.
Fulmer, Ray M.: *See*—
Symborski, Alex P.; Fulmer, Ray M.; and Thomas, David W., 4,163,653, Cl. 65-2.000.
Fultz, Chester R.: *See*—
Burkhart, L. Elkin; Fultz, Chester R.; and Maulden, Kerry A., 4,163,516, Cl. 228-114.000.
Furukawa, Hiroshi: *See*—
Tawa, Tutomu; and Furukawa, Hiroshi, 4,163,308, Cl. 29-25.190.
Furukawa, Naotake: *See*—
Takeuchi, Tatuo; Ono, Kazuyoshi; Furukawa, Naotake; Sugiura, Katsuaki; Suzuki, Osamu; and Shimizu, Takeshi, 4,163,358, Cl. 57-78.000.
Futamura, Shoji: *See*—
Higuchi, Noboru; and Futamura, Shoji, 4,163,640, Cl. 425-466.000.
G. D. Hanna Incorporated: *See*—
Hanna, Gary D., 4,163,303, Cl. 16-135.000.
G. D. Searle & Co.: *See*—
Sprenger, William K., deceased, 4,163,859, Cl. 560-53.000.
G. S. Compactors Limited: *See*—
Sercombe, Geoffrey, 4,163,420, Cl. 100-223.000.
Galione, Edward R. D., to W. Vinten Limited. Torsion counteracting pivots. 4,163,538, Cl. 248-278.000.
Gallet, Jean-Baptiste: *See*—
Azam, Guy; Bensussan, Andre; Gallet, Jean-Baptiste; and Tran, Duc Tien, 4,163,901, Cl. 250-401.000.
Gallo, Mario; and Wirth, Johannes, to Wirth, Gallo & Co. Mass and force meter. 4,163,386, Cl. 73-141.00R.
Ganz, Robert H., to Federal Paper Board Company, Inc. Bottle packaging machine. 4,163,352, Cl. 53-393.000.
Garcin, Felix; and Weil, Marcel, to Air Industrie. Electrostatic liquid spraying nozzle. 4,163,520, Cl. 239-707.000.
Garden City Envelope Company: *See*—
Dohnalik, Joseph J., 4,163,651, Cl. 55-344.000.
Garlington, Frank E.; and Famiano, Carl J., to Sprague Electric Company. Wound multi-capacitor filter. 4,163,956, Cl. 333-12.000.
Gautier, Jean-Claude C.: *See*—
Malassine, Bernard P.; Gautier, Jean-Claude C.; Chevalier, Sammy H.; and Berteleau, Gerard R., 4,163,740, Cl. 260-31.20N.
Gavagan, James A.: *See*—
Stephenson, Robert L.; Fox, William R.; and Gavagan, James A., 4,163,880, Cl. 200-61.58B.
Gazzi, Luigi; and Sguera, Oronzo, to Snamprogetti S.p.A. Refrigerative fractionation of cracking-gases in ethylene production plants. 4,163,652, Cl. 62-28.000.
Gebr. Happich GmbH: *See*—
Mahler, Gert; Viertel, Lothar; and Meissner, Wolfgang, 4,163,579, Cl. 296-97.00H.
Geery, Michael J.: *See*—
Jones, Lawrence T.; Sims, Anson; Howden, Ashley G.; and Geery, Michael J., 4,163,341, Cl. 46-262.000.
General Electric Company: *See*—
Cline, Harvey E.; Anthony, Thomas R.; and Giaever, Ivar, 4,163,983, Cl. 357-12.000.
Espelage, Paul M.; and Walker, Loren H., 4,164,015, Cl. 363-87.000.
Fogg, Lewis W.; Rauhala, Kenneth R.; Satterfield, H. Eugene; and Scott, Eion G., 4,163,342, Cl. 47-58.000.
Gottung, William H.; and Torossian, Kevork A., 4,163,912, Cl. 310-45.000.
Janu, Maria M.; and Wagner, Howard R., 4,163,929, Cl. 318-628.000.
Johnson, Donald S., 4,163,833, Cl. 528-205.000.
Plugge, Jay S.; and Hammer, Eugene S., 4,163,599, Cl. 339-115.00C.
Rickert, Milton E., Jr., 4,163,702, Cl. 204-181.00T.
Ryckman, William D., Jr., 4,163,963, Cl. 338-28.000.
Woods, Lee O., 4,164,000, Cl. 361-27.000.
Genevieve I. Hanscom, Robert M. Magnuson, Lois J. Thomson, Trustees of the Estate of Roy M. Magnus: *See*—
Crawford, Lynn D., 4,163,406, Cl. 83-424.000.
George Nelson & Company: *See*—
Nelson, George H., 4,163,592, Cl. 312-194.000.
Georgizon, Evgeny B.: *Sre*—
Lapy, Viktor J.; Chernov, Boris P.; Georgizon, Evgeny B.; Koshevoi, Anatoly A.; Yavorsky, Gerald I.; Glaziev, Valentin I.; Rivkin, Boris S.; Yakushenkov, Andrei A.; and Kurochkin, Sergei F., 4,163,972, Cl. 343-7.00A.
Gerard, Henry M., to Hughes Aircraft Company. Hybrid transversal filter. 4,163,958, Cl. 333-165.000.
Geren, George W.: *See*—
Kuo, Han C.; Geren, George W.; Corvin, Thomas E.; and Ahn, Byung K., 4,163,698, Cl. 204-1.00T.
Gernez, Alain, to Compagnie Europeenne pour l'Equipement Menager "CEPEM". Method of coating the inside surface of a hollow body. 4,163,703, Cl. 204-181.00R.
Gesell, Reinhard: *See*—
Angelbeck, Rolf; Gesell, Reinhard; and Sommer, Rudiger, 4,163,980, Cl. 346-155.000.
Gessell, Donald E., to Dow Chemical Company, The. High efficiency titanate catalyst for polymerizing olefins. 4,163,831, Cl. 526-153.000.
Geyer, Charles J., Jr.; and White, Ben E., to Fiber Associates, Inc. Process and apparatus for making alkali cellulose in sheet form. 4,163,840, Cl. 536-101.000.
Giaever, Ivar: *See*—
Cline, Harvey E.; Anthony, Thomas R.; and Giaever, Ivar, 4,163,983, Cl. 357-12.000.
Gibson, David E.: *See*—
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Gibson, K. R.: *See*—
Jacobson, Robert L.; and Gibson, K. R., 4,163,708, Cl. 208-89.000.
Gibson, William H.: *See*—
Herbers, Dennis M.; and Gibson, William H., 4,163,923, Cl. 315-208.000.
Giesecke, Henning; Hocker, Jurgen; and Merten, Rudolf, to Bayer Aktiengesellschaft. Parabanic acid aminals. 4,163,857, Cl. 548-318.000.
Gilbert, Eli. Information retrieval system for providing retrievable updateable display of a permanent microfilm record. 4,164,024, Cl. 364-900.000.
Gillott, Donald H.: *See*—
Simes, James G.; and Gillott, Donald H., 4,163,911, Cl. 310-27.000.
Ginny Bee Harvester Corporation: *See*—
Edwards, John W., 4,163,355, Cl. 56-328.00R.
Ginther, George E., Sr.: *See*—
Bachman, Joseph L., Jr.; Ginther, George E., Sr.; and Johnson, A. David, Jr., 4,163,414, Cl. 93-53.00M.
Giolito, Silvio L., to Stauffer Chemical Company. Polyalkylene glycol alkyl polyphosphites. 4,163,767, Cl. 260-929.000.
Giovannetti, Fiorello. Joint for furniture. 4,163,618, Cl. 403-245.000.
Glaziev, Valentin I.: *See*—
Lapy, Viktor J.; Chernov, Boris P.; Georgizon, Evgeny B.; Koshevoi, Anatoly A.; Yavorsky, Gerald I.; Glaziev, Valentin I.; Rivkin, Boris S.; Yakushenkov, Andrei A.; and Kurochkin, Sergei F., 4,163,972, Cl. 343-7.00A.
Glennon, Timothy F.; Sarphie, Theodore E.; and Faulkner, Dennis T., to Sundstrand Corporation. Compressor surge control with airflow measurement. 4,164,033, Cl. 364-431.000.
Glennon, Timothy F.; Sarphie, Theodore E.; and Faulkner, Dennis T., to Sundstrand Corporation. Compressor surge control with pressure rate of change control. 4,164,034, Cl. 364-431.000.
Glennon, Timothy F.; and Sarphie, Theodore E., to Sundstrand Corporation. Surge control for variable speed-variable geometry compressors. 4,164,035, Cl. 364-431.000.
Globe Tool and Engineering Company, The: *See*—
Seitz, David R.; and Heaton, Mark T., 4,163,931, Cl. 318-569.000.
Goettler, Ernst; and Grueter, Otto, to Siemens Aktiengesellschaft. CCD storage module. 4,164,040, Cl. 365-183.000.

Goff, Dewain R.: *See—*
Aysta, James E.; and Goff, Dewain R., 4,163,596, Cl. 339-97.00P.
Goldhagen, Samuel: *See—*
Rothenstein, Julius; and Goldhagen, Samuel, 4,163,681, Cl. 149-11.000.
Goldscher, Kenneth J. Turmeric coloring process and composition for foods and beverages. 4,163,803, Cl. 426-250.000.
Goodyear Tire & Rubber Company, The: *See—*
Dobson, Robert L., 4,163,467, Cl. 152-347.000.
D'Sidocky, Richard M., 4,163,757, Cl. 260-570.00R.
Kubinski, Donald C., 4,163,685, Cl. 156-405.00R.
Lammlein, Robert A., Jr., 4,163,683, Cl. 156-136.000.
Watts, George T., 4,163,466, Cl. 152-158.000.
Gordy, Robert S.: *See—*
Chambers, Ramon P.; Gordy, Robert S.; Sanders, David E.; and Morrison, Cameron E., 4,163,944, Cl. 325-446.000.
Gorin, Everett: *See—*
Kulik, Metro D.; and Gorin, Everett, 4,163,776, Cl. 423-567.000.
Goslin, Richard L.: *See—*
Schroeder, James E.; and Goslin, Richard L., 4,163,907, Cl. 307-209.000.
Goto, Kiyoshi: *See—*
Tsuchiya, Shozo; Hayashi, Hideo; Sasaki, Makoto; Goto, Kiyoshi; and Matsubara, Toru, 4,163,763, Cl. 525-290.000.
Goto, Mikio: *See—*
Ikarashi, Takeo; Goto, Mikio; Sano, Kozo; Osaki, Naoto; Aoyama, Tetsuo; and Horie, Shigeru, 4,163,863, Cl. 568-798.000.
Goto, Tetsuro: *See—*
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Gottsegen, Agnes: *See—*
Feuer, Laszlo; Farkas, Lorand; Nogradi, Mihaly; Vermes, Borbala; Gottsegen, Agnes; and Wolfner, Andras, 4,163,746, Cl. 260-345.200.
Gottung, William H.; and Torossian, Kevork A., to General Electric Company. Electrical insulating sheet material and electric winding made therefrom. 4,163,912, Cl. 310-45.000.
Goudriaan, Frans; and van Klinken, Jakob, to Shell Oil Company. Asphalt conversion. 4,163,707, Cl. 208-44.000.
Gould Advance Limited: *See—*
Crowe, John E.; and Shanley, John J., 4,164,014, Cl. 363-49.000.
Graham, Charles I.: *See—*
Meyer, Robert H.; Graham, Charles I.; Rudolph, John E.; and Haas, Robert E., 4,163,804, Cl. 426-315.000.
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Green, John D.; and Harris, Ian R., to British-American Tobacco Company Limited. Tobacco-smoke filters. 4,163,452, Cl. 131-10.00A.
Green, Norman W., to Occidental Petroleum Corporation. Fluidizing a mixture of particulate coal and char. 4,163,693, Cl. 201-22.000.
Green, Robert B. Method and means for producing rolled metal products. 4,163,312, Cl. 29-527.700.
Greenaway, David L., to LGZ Landis & Gyr Zug AG. Optically coded document and method of making same. 4,163,570, Cl. 283-8.00A.
Greer Hydraulics, Inc.: *See—*
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Gregor, Harry P. Separating substances with pressure-driven affinity sorption membranes. 4,163,714, Cl. 210-23.00F.
Greive, Aloys; and Horstmann, Aloys, to Hamel GmbH, Zwirnmaschinen. Apparatus for cable-twisting two yarns. 4,163,357, Cl. 57-58.360.
Grice, Karl R., Jr., to Fiber Controls Corporation. Auto-leveler circuit. 4,163,927, Cl. 318-68.000.
Griffin, Kenneth E. Tunnel or like wall cleaning machine. 4,163,301, Cl. 15-50.00R.
Griffith, Robert C., to Dynamic Sciences International, Inc. Programmable sound synthesizer. 4,164,020, Cl. 364-718.000.
Groninger, Greg D., to Dow Chemical Company, The. Vaporizer. 4,163,371, Cl. 62-50.000.
Grooss, Frank A.; and Simmons, Gerald P., to Caterpillar Tractor Co. Tower assembly. 4,163,498, Cl. 414-697.000.
Grossman, Leonard N.; and Kaznoff, Alexis I., to United States of America, Energy. Vented nuclear fuel element. 4,163,689, Cl. 176-68.000.
Grouard, Gerard, to La Spirotechnique. Industrielle et Commerciale. Breathing apparatus. 4,163,448, Cl. 128-142.200.
Grueter, Otto: *See—*
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Guenther, William D.; and Mazziotti, Philip J., to Dana Corporation. Rotary valve timing apparatus. 4,163,438, Cl. 123-190.00A.
Guilhem, Robert; Rivron, Maurice; and Weulersse, Bruno, to Thomson-CSF. Method of measuring the altitude of a target maneuvering at a very low elevation, and a tracking radar using same. 4,163,975, Cl. 343-16.00M.
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Gulliksen, John E., to Koehler Manufacturing Company. Luminaire apparatus for reflecting radiant energy and methods of controlling characteristics of reflected radiant energy. 4,164,012, Cl. 362-282.000.
Gunne, Ingemar; and Almgren, Bertil, to Siemens Aktiengesellschaft. Bottle seal. 4,163,500, Cl. 215-260.000.
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Gutierrez, Manuel; and Enger, Phillip F., to United States of America, Interior. Void detector system. 4,163,393, Cl. 73-584.000.
Gyursanszky, Zoltan L., to Honeywell Ltd. Two-wire ballast for fluorescent tube dimming. 4,163,925, Cl. 315-276.000.
Haarmann & Reimer Gesellschaft mit beschrankter Haftung: *See—*
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Hanna, Gary D., to G. D. Hanna Incorporated. Hinge structure. 4,163,303, Cl. 16-135.000.
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Hardy, Charles T., to Safe-T-Lawn, Inc. Oscillating mechanism. 4,163,522, Cl. 239-230.000.
Harmer, Alan L., to Battelle Development Corporation. Optical strain gauge. 4,163,397, Cl. 73-800.000.
Harr, Jerome D., to International Business Machines Corporation. Peak detecting circuitry and dual threshold circuitry therefor. 4,163,909, Cl. 307-351.000.
Harrington, Joseph K.; Kvam, Donald C.; Mendel, Arthur; and Robertson, Jerry E., to Minnesota Mining and Manufacturing Company. Stunting plant growth with N-substituted perfluoroalkanesulfonamides. 4,163,659, Cl. 71-76.000.
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Works Ltd. Thiazoloisoquinolines with coronary and respiratory effects. 4,163,786, Cl. 421-258.000.

Harte, Richard A.; and Deindoerfer, Fred H., to International Diagnostic Technology, Inc. Test for quantitation of immunoglobulin and identification of abnormal immunoglobulin. 4,163,779, Cl. 424-1.000.

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Hartwell, Walter T.; Hinshaw, David L.; Hoffner, Charles W., II; and Toy, Wing N., to Bell Telephone Laboratories, Incorporated. Memory organization to distribute power dissipation and to allow single circuit pack memory growth. 4,164,041, Cl. 365-238.000.

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Haselby, Robert D.: *See—*
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Hauxwell, Frank; Stansfield, James F.; and Topham, Arthur, to Imperial Chemical Industries Limited. Dispersing agents. 4,163,749, Cl. 260-404.500.

Hawfield, James D., Jr.: *See—*
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Hayashi, Hideo: *See—*
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Hayes, Cecil L., to Rockwell International Corporation. High energy coherent pulse source for laser system. 4,163,954, Cl. 332-7.510.

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Hebert, Chris J.; and Hollister, Ralph T. Cleaning apparatus for ship holds. 4,163,455, Cl. 134-167.00R.

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Heller, Rudolf; and Schattmaier, Kurt, to Contraves AG. Support device. 4,163,536, Cl. 248-118.000.

Hellgren, Keijo E., to ASEA Aktiebolag. Hydraulic press. 4,163,378, Cl. 72-63.000.

Helms, Richard A.: *See—*
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Hendricks, Charles D., to United States of America, Energy. Method and apparatus for producing small hollow spheres. 4,163,637, Cl. 425-6.000.

Hennig, Kurt; and Klein, Manfred. Flexible covering for power supply lines, guideways and the like. 4,163,591, Cl. 308-3.500.

Herbers, Dennis M.; and Gibson, William H. Variable duty cycle lamp circuit. 4,163,923, Cl. 315-208.000.

Hergert, Reinhard: *See—*
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Herron, Keith R. Air release valve. 4,163,456, Cl. 137-202.000.

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Highland, Stanley E. Line travelling skips. 4,163,480, Cl. 182-14.000.

Higuchi, Noboru; and Futamura, Shoji, to NGK Insulators, Ltd.; and Institute of Technology Precision Electrical Discharge Works. Apparatus for extruding a honeycomb structural body. 4,163,640, Cl. 425-466.000.

Higuchi, Tadayasu. Method for forming a continuous footing with prefabricated footing blocks. 4,163,621, Cl. 405-255.000.

Hinchman, Leslie R.; and Hinchman, Robert B., Sr., to Caldwell, Bessie L., a part interest. Hydraulic pump mechanically interconnected with fluid motor distributors. 4,163,632, Cl. 417-318.000.

Hinchman, Robert B., Sr.: *See—*
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Hirano, Katsumi; Teranishi, Takeshi; Kosaki, Kunio; and Honda, Kazuhiko, to Pilot Ink Co., Ltd. Aqueous ink composition for writing instruments. 4,163,675, Cl. 106-22.000.

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Hodges, Marvin P. Color television projection system. 4,163,990, Cl. 358-64.000.

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Semjonow, Valentin; and Foedrowitz, Jurgen, 4,163,305, Cl. 19-299.000.
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Hoffmann, Charles; and Bouley, Etienne, to Hexachimie. Benzothiazepine compounds and compositions. 4,163,785, Cl. 424-250.000.

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Holbek, Carl C.: *See—*
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Homma, Hiroshige: *See—*
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Honjo, Takeshige, to Murata Kikai Kabushiki Kaisha. Method and apparatus for driving and piecing-up open-end spinning units. 4,163,359, Cl. 57-93.000.

Hood, Walter J.; and Gulden, George, Jr., to Kent Corporation. Coil depletion sensor. 4,163,527, Cl. 242-55.000.

Hoop, James B. Means for suspending articles from a ceiling. 4,163,576, Cl. 294-19.00R.

Hoover Universal, Inc.: *See—*
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Kamath, G. Sanjiv; and Anderson, Carl L., 4,163,987, Cl. 357-30.000.
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Hulin, Jean-Pierre; and de Vecchis, Michel, to Societe Lignes Telegraphiques et Telephoniques. Extrusion tool. 4,163,641, Cl. 425-461.000.
Hunter, William M.; and Lock, John D., to National Research Development Corporation. Automation of discrete analysis systems. 4,163,643, Cl. 23-230.00R.
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Iden, Floyd W.; and Scherer, George P., to International Telephone and Telegraph Corporation. Cylindrical mode power divider/combiner with isolation. 4,163,955, Cl. 333-127.000.
Igarashi, Shuji; Fujisawa, Yoshikazu; and Igarashi, Toshio, to Dipsol Chemicals Co., Ltd. Method for stabilizing tin or tin alloy electroplating baths. 4,163,700, Cl. 204-43.00S.
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Ikari, Yoshikatsu; Yokoyama, Shiyoichiro; and Katoh, Keisuke, to Agency of Industrial Science & Technology; and Sumitomo Jukikai Envirotech, Inc. Method for treatment of waste water. 4,163,715, Cl. 210-28.000.
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Kobetsky, Robert G., 4,163,885, Cl. 219-10.49R.
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Inaba, Masao; and Kashigi, Kazuo, to Nippon Electric Co., Ltd. Digital video effects system employing a chroma-key tracking technique. 4,163,992, Cl. 358-183.000.
Inks, Clyde G., to BASF Wyandotte Corporation. Acidizing-gel composition. 4,163,727, Cl. 252-8.55C.
Inoue, Atsuo; and Mikami, Takeshi, to Fuji Photo Film Co., Ltd. Silver halide photographic material containing ultraviolet light absorbing agent. 4,163,671, Cl. 96-74.000.
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Voegeli, Otto, 4,164,028, Cl. 365-20.000.
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Harte, Richard A.; and Deindoerfer, Fred H., 4,163,779, Cl. 424-1.000.
International Flavors & Fragrances Inc.: *See—*
Sanders, James M.; Vinals, Joaquin F.; and Schmitt, Frederick L., 4,163,737, Cl. 252-522.000.
International Standard Electric Corporation: *See—*
Thompson, George H. B.; and Lovelace, David F., 4,163,952, Cl. 331-94.50H.
International Tapetronics Corporation: *See—*
Bell, Dennis M., 4,163,507, Cl. 221-2.000.
International Telephone and Telegraph Company: *See—*
Aujla, Sharanjit S., 4,163,594, Cl. 339-82.000.
International Telephone and Telegraph Corporation: *See—*
Iden, Floyd W.; and Scherer, George P., 4,163,955, Cl. 333-127.000.
Maggi, Charles R., 4,163,871, Cl. 179-1.0CN.
November, Milton H., 4,163,388, Cl. 73-190.0CV.
Intertech Zeichengerate Gunther Partes KG: *See—*
Partes, Gunther, 4,163,322, Cl. 33-27.00B.
Ishida, Nakao; Suzuki, Fujio; Maeda, Hiroshi; Fujii, Toshikatsu; and Mizutani, Ituro, to Kirin-Seagram Limited. Ks-2-a. 4,163,780, Cl. 424-116.000.
Ishigaki, Yukinobu; and Muraoka, Teruo, to Victor Company of Japan, Ltd. System for removing interference distortion in the demodulated signal of a frequency-modulated signal. 4,163,945, Cl. 325-473.000.
Ishihata, Kiyoshi: *See—*
Akazawa, Susumu; Murakami, Kyoichi; Ishihata, Kiyoshi; and Tsuchiya, Takao, 4,163,989, Cl. 358-27.000.
Ishii, Tetsuo, to Fuji Xerox Co., Ltd. Method of forming radiographic images. 4,163,898, Cl. 250-315.00R.
Ishikawa, Masao, to Nissan Motor Company, Limited. Indicator gauge with illuminated pointer. 4,163,428, Cl. 116-288.000.
Ishikawa, Takashi. Architectural panel material for use as roofing material, material for external wall and the like purposes. 4,163,351, Cl. 52-542.000.
Isomura, Yasuo: *See—*
Kubo, Kazuo; Ito, Noriki; Souzu, Isao; Isomura, Yasuo; and Homma, Hiroshige, 4,163,844, Cl. 544-32.000.
Ithaca Gun Company Incorporated: *See—*
Tollinger, James, 4,163,334, Cl. 42-25.000.
Ito, Fumio: *See—*
Sakurada, Nobuaki; Mashimo, Yukio; Ito, Tadashi; Ito, Fumio; and Shinoda, Nobuhiko, 4,163,935, Cl. 324-29.500.
Ito, Noriki: *See—*
Kubo, Kazuo; Ito, Noriki; Souzu, Isao; Isomura, Yasuo; and Homma, Hiroshige, 4,163,844, Cl. 544-32.000.
Ito, Tadashi: *See—*
Sakurada, Nobuaki; Mashimo, Yukio; Ito, Tadashi; Ito, Fumio; and Shinoda, Nobuhiko, 4,163,935, Cl. 324-29.500.
Ito, Yoshio; Tohyama, Yoshikuni; and Sagara, Seiji, to Canon Kabushiki Kaisha. Separator device for transfer medium. 4,163,549, Cl. 271-174.000.
Itoh, Noboru: *See—*
Kanada, Eiji; Itoh, Noboru; Ikeda, Hiroshi; and Iwata, Tamotsu, 4,163,669, Cl. 96-74.000.
Itoh, Shigekazu: *See—*
Jikihara, Kazuo; Itoh, Shigekazu; Takayama, Shuichi; Sato, Koichi; Kimura, Ichiro; and Chiyomaru, Isao, 4,163,661, Cl. 71-108.000.
Ives, Robert K., to Michaels of Oregon Co. Black powder firing nipple. 4,163,335, Cl. 42-83.000.
Iwata, Tamotsu: *See—*
Kanada, Eiji; Itoh, Noboru; Ikeda, Hiroshi; and Iwata, Tamotsu, 4,163,669, Cl. 96-74.000.
Iwatsu Electric Co., Ltd.: *See—*
Kokaji, Norio, 4,163,979, Cl. 346-74.100.
Jabsen, Felix S., to Babcock & Wilcox Company, The. Nuclear reactor fuel assembly spacer grid. 4,163,690, Cl. 176-78.000.
Jackman, Kristina R., to Merck & Co., Inc. Citrus fruit juice and drink. 4,163,807, Cl. 426-599.000.
Jacob, Isaac: *See—*
Shaltiel, David; Davidov, Dan; and Jacob, Isaac, 4,163,666, Cl. 75-177.000.

Jacobellis, Alfonse A., to Greer Hydraulics, Inc. High frequency pulse dampener. 4,163,461, Cl. 138-30.000.

Jacobs, Eli S.: *See*—
Russell, James T., 4,163,600, Cl. 350-6.700.

Jacobson, Robert E., Jr., to United States of America, Air Force. Means for developing a radar tracking error signal. 4,163,973, Cl. 343-16.00M.

Jacobson, Robert L.; and Gibson, K. R., to Chevron Research Company. Process for the removal of thiols from hydrocarbon oils. 4,163,708, Cl. 208-89.000.

Jaeger: *See*—
Bezard, Jean-Jacques; Jourdain, Charles-Henri; and Lalanne, Bruno, 4,163,391, Cl. 73-295.000.

James, Peter G.: *See*—
Foster, Alan I.; James, Peter G.; McCarroll, John J.; and Tennison, Stephen R., 4,163,775, Cl. 423-363.000.

James, Rex L.: *See*—
Olander, Emil E., Jr.; James, Rex L.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., 4,164,019, Cl. 364-710.000.
Olander, Emil E., Jr.; James, Rex L.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., 4,164,039, Cl. 364-709.000.

Jamshidi, Khosrow. Biopsy needle and removable pad therefor. 4,163,446, Cl. 128-754.000.

Janousek, Rade: *See*—
Laflaquiere, Regis; Janousek, Rade; and Faessler, Rene, 4,163,304, Cl. 19-97.000.

Janu, Maria M.; and Wagner, Howard R., to General Electric Company. Handle apparatus for a power-assist device. 4,163,929, Cl. 318-628.000.

Japan Storage Battery Company Limited: *See*—
Saito, Satoshi, 4,164,004, Cl. 361-433.000.

Jaworski, Eugene; and Breslow, Jeffrey D., to Marvin Glass & Associates. Vibratory game apparatus. 4,163,558, Cl. 273-115.000.

Jenkins, Cecil, to Lee C. Moore Corporation. Movable working platform for use in racking drill pipe. 4,163,625, Cl. 414-22.000.

Jerome, Henry M. Clamping apparatus for assembling picture frames. 4,163,547, Cl. 269-42.000.

Jikihara, Kazuo; Itoh, Shigekazu; Takayama, Shuichi; Sato, Koichi; Kimura, Ichiro; and Chiyomaru, Isao, to Kumiai Chemical Industry Co., Ltd. Phenoxyphenoxy crotonic acid derivatives and herbicidal composition. 4,163,661, Cl. 71-108.000.

Johnsen, Arne A.; and Kakarala, Chandrasekhara R., to Babcock & Wilcox Company, The. Industrial technique. 4,163,470, Cl. 165-70.000.

Johnson, A. David, Jr.: *See*—
Bachman, Joseph L., Jr.; Ginther, George E., Sr.; and Johnson, A. David, Jr., 4,163,414, Cl. 93-53.00M.

Johnson, Donald S., to General Electric Company. Method for making aromatic cyclic polyformal. 4,163,833, Cl. 528-205.000.

Johnson, John L.; and Vanzant, Billy W., to Sub Sea Research & Development Corp. Method and apparatus for closing underwater wells. 4,163,477, Cl. 166-362.000.

Johnson, Matthey & Co., Limited: *See*—
Acres, Gary J. K.; and Darling, Alan S., 4,163,736, Cl. 252-466.0PT.
Bird, Alfred J.; Priestley, Timothy M.; and Winterbottom, John M., 4,163,750, Cl. 260-409.000.

Johnson, Roy A.; and Sih, John C., to Upjohn Company, The. 5-Hydroxy-PGI$_1$ piperidylamides. 4,163,842, Cl. 542-426.000.

Johnston, James E., to Caterpillar Tractor Co. Transmission shift control lock assembly. 4,163,398, Cl. 74-483.00K.

Jones, Lawrence T.; Sims, Anson; Howden, Ashley G.; and Geery, Michael J., to California R & D Center. Slotless steering assembly. 4,163,341, Cl. 46-262.000.

Jourdain, Charles-Henri: *See*—
Bezard, Jean-Jacques; Jourdain, Charles-Henri; and Lalanne, Bruno, 4,163,391, Cl. 73-295.000.

Judson, Philip N.: *See*—
Percival, Albert; and Judson, Philip N., 4,163,846, Cl. 544-262.000.

Kabushiki Kaisha Daini Seikosha: *See*—
Tanaka, Kojiro; and Yoda, Kazuhiro, 4,163,360, Cl. 58-39.500.

Kabushiki Kaisha Think Laboratory: *See*—
Shigeta, Tatsuo, 4,163,454, Cl. 134-57.00R.

Kabushiki Kaisha Tokai Rika Denki Seisakusho: *See*—
Kato, Takayuki; Sumi, Kazumasa; Miyashita, Masanori; Nomura, Osamu; and Naito, Shouzo, 4,163,385, Cl. 73-35.000.

Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See*—
Takeuchi, Tatuo; Ono, Kazuyoshi; Furukawa, Naotake; Sugiura, Katsuaki; Suzuki, Osamu; and Shimizu, Takeshi, 4,163,358, Cl. 57-78.000.

Kabushiki Kaisha Toyota Chuo Kenkyusho: *See*—
Kato, Takayuki; Sumi, Kazumasa; Miyashita, Masanori; Nomura, Osamu; and Naito, Shouzo, 4,163,385, Cl. 73-35.000.

Kagata, Toyota, to Aisin Seiki Kabushiki Kaisha. Free wheel hub. 4,163,486, Cl. 192-35.000.

Kah, Ann F.: *See*—
McGinniss, Vincent D.; Ting, Vincent W.; and Kah, Ann F., 4,163,809, Cl. 427-44.000.

Kaiser, Emil T. Synthesis of steroids. 4,163,744, Cl. 260-239.55C.

Kaiser, Reinhard: *See*—
Barth, Otto; Becker, Hans-Joachim; Behre, Horst; Kaiser, Reinhard; Steffan, Guido; and Zander, Jurgen, 4,163,752, Cl. 260-508.000.

Kakarala, Chandrasekhara R.: *See*—
Johnsen, Arne A.; and Kakarala, Chandrasekhara R., 4,163,470, Cl. 165-70.000.

Kalka, Josef, to Chemische Werke Huls Aktiengesellschaft. Process for the production of polyvinyl chloride based powders suitable for plastisol preparation. 4,163,838, Cl. 528-501.000.

Kallianos, Andrew G.; and Simpson, Melvyn I., to Liggett Group Inc. 7-Alkoxy-1,2-benzopyrones as tobacco flavorants. 4,163,453, Cl. 131-17.00R.

Kamath, G. Sanjiv; and Anderson, Carl L., to Hughes Aircraft Company. GaAs-GaAlAs solar cells. 4,163,987, Cl. 357-30.000.

Kanada, Eiji; Itoh, Noboru; Ikeda, Hiroshi; and Iwata, Tamotsu, to Mitsubishi Paper Mills, Ltd. Multilayer silver halide color photographic material. 4,163,669, Cl. 96-74.000.

Kandyba, Petr E.: *See*—
Kupriyanov, Mikhail J.; Lapir, Gennady M.; Likharev, Konstantin K.; Semenov, Vasily K.; and Kandyba, Petr E., 4,164,030, Cl. 365-162.000.

Kankaanpaa, Matti, to Valmet Oy. Apparatus for dewatering in a paper machine. 4,163,688, Cl. 162-359.000.

Kao Soap Co., Ltd.: *See*—
Sai, Fumio; and Murata, Moriyasu, 4,163,732, Cl. 252-99.000.

Kappler, Hermann; and Chezek, Norman A., to Niemand Bros., Inc. Tubular container. 4,163,517, Cl. 229-45.000.

Kapuscinski, Peter R. Disposable stapler apparatus and methods of constructing and utilizing same. 4,163,515, Cl. 227-120.000.

Karch, John A.: *See*—
Burk, Emmett H.; Yoo, Jin S.; Karch, John A.; and Sun, Jui-Yuan, 4,163,709, Cl. 208-120.000.
Burk, Emmett H.; Yoo, Jin S.; Karch, John A.; and Sun, Jui-Yuan, 4,163,710, Cl. 208-120.000.

Karpati, Egon: *See*—
Clauder, Otto; Kiraly, Arpad; Kokosi, Jozsef; Karpati, Egon; and Szporny, Laszlo, 4,163,851, Cl. 546-51.000.

Karrer, Friedrich: *See*—
Meyer, Willy; Drabek, Jozef; Gsell, Laurenz; and Karrer, Friedrich, 4,163,792, Cl. 424-272.000.

Kartanson, John M., to RJR Archer, Inc. Method and apparatus for strip laminating. 4,163,684, Cl. 156-259.000.

Kaseta, Robert G.; Daugherty, Lenn; Hinlein, Sigmund; Feldstein, Michael; Thackaberry, Harold; and Barrows, Robert E., to Data General Corporation. Rigid magnetic disc memory apparatus employing stepper motor drive and pivotable head support with temperature compensation. 4,163,996, Cl. 360-97.000.

Kashigi, Kazuo: *See*—
Inaba, Masao; and Kashigi, Kazuo, 4,163,992, Cl. 358-183.000.

Kato, Takayuki; Sumi, Kazumasa; Miyashita, Masanori; Nomura, Osamu; and Naito, Shouzo, to Kabushiki Kaisha Toyota Chuo Kenkyusho; Toyota Jidosha Kogyo Kabushiki Kaisha; and Kabushiki Kaisha Tokai Rika Denki Seisakusho. Engine knocking meter. 4,163,385, Cl. 73-35.000.

Katoh, Keisuke: *See*—
Ikari, Yoshikatsu; Yokoyama, Shiyoichiro; and Katoh, Keisuke, 4,163,715, Cl. 210-28.000.

Kauffman, Ivan L.: *See*—
Dwyer, Gregory J.; and Kauffman, Ivan L., 4,163,590, Cl. 308-3.00R.

Kaufhold, Wolfgang, to Siemens Aktiengesellschaft. Six-pulse rectifier circuit. 4,164,013, Cl. 363-45.000.

Kawabata, Toshihiko: *See*—
Asai, Kiyotsugu; Takaguchi, Kazunori; Kawabata, Toshihiko; Yatsugi, Shigeru; and Ichikawa, Toshiyuki, 4,163,814, Cl. 427-372.00R.

Kawaguchi, Hiroshi: *See*—
Baba, Takashi; Kawaguchi, Hiroshi; and Nishikawa, Kohji, 4,163,483, Cl. 188-71.800.

Kawaguchi, Munetaka; and Miyake, Masayoshi, to Sumitomo Electric Industries, Ltd. Self-bonding magnet wires and coils made therefrom. 4,163,826, Cl. 428-371.000.

Kawai, Hiroshi: *See*—
Egasaki, Takashi; and Kawai, Hiroshi, 4,163,528, Cl. 242-84.21R.

Kawasaki Jukogyo Kabushiki Kaisha: *See*—
Terai, Kiyohide; and Nagai, Hiroyoshi, 4,163,890, Cl. 219-121.0EB.

Kaznoff, Alexis I.: *See*—
Grossman, Leonard N.; and Kaznoff, Alexis I., 4,163,689, Cl. 176-68.000.

Kecskemethy, Geza; Virag, Gyorgy; Tihanyi, Robert; and Czirmai, Zoltan, to Muanyagipari Kutato Intezet. Dispenser having manually operated air controlled valves. 4,163,511, Cl. 222-144.500.

Keefe, George E., to International Business Machines Corporation. Apparatus for high density bubble storage. 4,164,029, Cl. 365-36.000.

Kelly, Robert R.: *See*—
Sheldon, Loren B.; and Kelly, Robert R., 4,163,401, Cl. 81-57.340.

Kendall Company, The: *See*—
McAvinn, James D.; and Patel, Harish A., 4,163,896, Cl. 219-525.000.

Kendig, Albert P.: *See*—
Patterson, Marvin L.; Haselby, Robert D.; and Kendig, Albert P., 4,163,928, Cl. 318-573.000.

Kennicutt, Robert B., to Caterpillar Tractor Co. Vehicle control system. 4,163,413, Cl. 91-521.000.

Kent Corporation: *See*—
Hood, Walter J.; and Gulden, George, Jr., 4,163,527, Cl. 242-55.000.
Kent, Peter, to Avco Corporation. Apparatus for disposal of leaking fluids in a turbofan engine. 4,163,366, Cl. 60-226.00R.
Keogh, Patrick J., to Ciba-Geigy AG. Recovery of color developer. 4,163,713, Cl. 210-22.00C.
Kerr, Ronald: *See*—
Randell, Brian; Kerr, Ronald; Melliar-Smith, Peter M.; Lauer, Hugh C.; and Horning, James J., 4,164,017, Cl. 364-200.000.
Keyes, John H. Infinitely variable ratio permanent magnet transmission. 4,163,914, Cl. 310-103.000.
Kijima, Shizumasa: *See*—
Morita, Eiichi; Ejiri, Hirosaburo; Takayanagi, Keizo; Morita, Yukio; Tanaka, Yasuhide; Kijima, Shizumasa; Hamamura, Kimio; and Yamatsu, Isao, 4,163,864, Cl. 568-628.000.
Kim, Choong R.: *See*—
Damm, Wendell W.; and Kim, Choong R., 4,163,950, Cl. 330-252.000.
Kimura, Ichiro: *See*—
Jikihara, Kazuo; Itoh, Shigekazu; Takayama, Shuichi; Sato, Koichi; Kimura, Ichiro; and Chiyomaru, Isao, 4,163,661, Cl. 71-108.000.
Kiraly, Arpad: *See*—
Clauder, Otto; Kiraly, Arpad; Kokosi, Jozsef; Karpati, Egon; and Szporny, Laszlo, 4,163,851, Cl. 546-51.000.
Kirin-Seagram Limited: *See*—
Ishida, Nakao; Suzuki, Fujio; Maeda, Hiroshi; Fujii, Toshikatsu; and Mizutani, Ituro, 4,163,780, Cl. 424-116.000.
Kirk, Bryan W.; Raber, Monte B.; Hatch, Donald J.; and Cramp, Harvey E. Method and apparatus for weaning patient from continuous mechanical ventilation. 4,163,450, Cl. 128-145.800.
Kiss, Pal: *See*—
Harsanyi, Kalman; Takacs, Kalman; Kiss, Pal; Szekeres, Laszlo; Papp, Gyula; and Benedek, Eva, 4,163,786, Cl. 421-258.000.
Kitagawa, Toshikatsu, to Miyakawa Industry Company, Limited. Multiple spindle drilling machine for wide flange beams. 4,163,623, Cl. 408-46.000.
Kitchen, John P.; and Samuels, David W., to Hoover Universal, Inc. Mattress foundation employing springs and cooperating foam bodies. 4,163,296, Cl. 5-255.000.
Klein, Manfred: *See*—
Hennig, Kurt; and Klein, Manfred, 4,163,591, Cl. 308-3.500.
Klein, Robert W.; and Nuss, George W., Jr. Synergistic compositions and method of use to treat inflammation. 4,163,783, Cl. 424-245.000.
Knauer, Karl; Schlichte, Max; and Pfleiderer, Hans-Joerg, to Siemens Aktiengesellschaft. Transversal filter with at least one analogue shift register, and process for the operation thereof. 4,163,957, Cl. 333-165.000.
Kobashi, Kiyoshi: *See*—
Nohira, Hidetaka; Kobashi, Kiyoshi; and Nakano, Jiro, 4,164,032, Cl. 364-431.000.
Kobayashi, Minoru, to Olympus Optical Company Ltd. Motor brush. 4,163,916, Cl. 310-246.000.
Kobayashi, Takeshi: *See*—
Matsuno, Takeshi; Nishiyama, Fumiya; and Kobayashi, Takeshi, 4,163,313, Cl. 29-563.000.
Kobetsky, Robert G., to Illinois Tool Works Inc. Induction heating core for adhesive fastening systems. 4,163,884, Cl. 219-10.49R.
Kobetsky, Robert G., to Illinois Tool Works Inc. Induction heating core and heating system for adhesive fasteners. 4,163,885, Cl. 219-10.49R.
Kock, William R.: *See*—
Wickett, Richard R.; and Kock, William R., 4,163,800, Cl. 424-326.000.
Koehler Manufacturing Company: *See*—
Gulliksen, John E., 4,164,012, Cl. 362-282.000.
Koenig, James P., to Bendix Corporation, The. Fluid pressure braking system. 4,163,584, Cl. 303-7.000.
Kohler, Hans W., to United States of America, Army. Proximity fuze. 4,163,423, Cl. 102-211.000.
Kohlmayr, Gerda M.; and Stonehart, Paul, to United Technologies Corporation. Method of fabricating a fuel cell electrode. 4,163,811, Cl. 427-115.000.
Kokaji, Norio, to Iwatsu Electric Co., Ltd. Method and apparatus for recording latent images on a magnetic medium in magnetography. 4,163,979, Cl. 346-74.100.
Kokosi, Jozsef: *See*—
Clauder, Otto; Kiraly, Arpad; Kokosi, Jozsef; Karpati, Egon; and Szporny, Laszlo, 4,163,851, Cl. 546-51.000.
Kolkowski, James J., to Sprague Electric Company. Capacitors with minimum ESR. 4,164,006, Cl. 361-433.000.
Komatsu, Akio; and Inaba, Masaharu, to Origin Electric Co., Ltd. Active gas plasma arc torch and a method of operating the same. 4,163,891, Cl. 219-121.00P.
Komatsu, Toshiyuki; Takasu, Yoshio; Fujii, Motoharu; and Sugiura, Susumu, to Canon Kabushiki Kaisha. Fixing apparatus. 4,163,892, Cl. 219-216.000.
Komet Stahlhalter- und Werkzeugfabrik Robert Breuning GmbH: *See*—
Eckle, Otto, 4,163,624, Cl. 408-185.000.
Kondo, Kiyosi; Tunemoto, Daiei; and Umemoto, Teruo, to Sagami Chemical Research Center. 2-Nitroethylcyclopentane compounds and process for preparing the same. 4,163,758, Cl. 260-586.00R.
Kondo, Shinichi: *See*—
Umezawa, Hamao; Takeuchi, Tomio; Kondo, Shinichi; and Shimazaki, Masami, 4,163,839, Cl. 536-24.000.
Kondo, Yutaka; and Nishina, Shuho, to Toyota Jidosha Kogyo Kabushiki Kaisha. Device for preventing the drawing-out of a seat belt webbing at the lock of a retractor. 4,163,530, Cl. 242-107.100.
Konigsbacher, Kurt S., to Blue Cross Laboratories. Ethanol-modified lecithin cookware spray composition. 4,163,676, Cl. 106-243.000.
Konijn, Nicolaas G. Dredge cutter head having a volute compartment. 4,163,330, Cl. 37-64.000.
Korpi, Teuvo T. Apparatus for chemical and electrochemical treatment. 4,163,705, Cl. 204-239.000.
Korte, Heinrich. Sheet metal connection in elongated lamp housings. 4,163,502, Cl. 220-3.940.
Kosaki, Kunio: *See*—
Hirano, Katsumi; Teranishi, Takeshi; Kosaki, Kunio; and Honda, Kazuhiko, 4,163,675, Cl. 106-22.000.
Koshevoi, Anatoly A.: *See*—
Lapy, Viktor J.; Chernov, Boris P.; Georgizon, Evgeny B.; Koshevoi, Anatoly A.; Yavorsky, Gerald I.; Glaziev, Valentin I.; Rivkin, Boris S.; Yakushenkov, Andrei A.; and Kurochkin, Sergei F., 4,163,972, Cl. 343-7.00A.
Kosik, John, to Consolidated Foods Corporation. Separable hose coupling. 4,163,593, Cl. 339-15.000.
Koslow-Batchelder Technologies: *See*—
Koslow, Evan E.; and Batchelder, J. Samuel, 4,163,657, Cl. 71-27.000.
Koslow, Evan E.; and Batchelder, J. Samuel, to Koslow-Batchelder Technologies. Soil conditioning composition and method of using same. 4,163,657, Cl. 71-27.000.
Kramer, Ralph. Motorcycle saddlebox. 4,163,513, Cl. 224-32.00R.
Kramer, Walter. Shopping cart skis. 4,163,564, Cl. 280-10.000.
Krause, Ernst H., to United States of America, Navy. Secret pulse signaling system. 4,163,872, Cl. 179-1.50R.
Kreil, Siegmund; Zech, Achim; and Hergert, Reinhard, to Siemens Aktiengesellschaft. Circuit for producing a pulse succession. 4,163,870, Cl. 178-26.00R.
Krekeler, Claude B., to Cincinnati Mine Machinery Co., The. Retaining means for the connecting pin which joins a bit holder to a base member. 4,163,581, Cl. 299-91.000.
Kremers, Frank J.: *See*—
Van der Mey, John E.; and Kremers, Frank J., 4,163,751, Cl. 260-457.000.
Krenzer, Orville; Midden, William E.; and Schmid, Charles F. Nonrotating axially-paying-out ski-rope bobbin. 4,163,529, Cl. 242-85.100.
Kress, James H. Fishing lure. 4,163,337, Cl. 43-42.050.
Krohn, David A.; and Merrin, Seymour. Method of manufacturing graded index optical fibers. 4,163,654, Cl. 65-3.00A.
Kronenberg, Marvin L., to Union Carbide Corporation. Metallic reducing additives for solid cathodes for use in nonaqueous cells. 4,163,829, Cl. 429-194.000.
Kruger, Hans-Rudolf: *See*—
Arndt, Friedrich; Kruger, Hans-Rudolf; and Rusch, Reinhart, 4,163,658, Cl. 71-73.000.
Kubinski, Donald C., to Goodyear Tire & Rubber Company, The. Application of sidewall to a tire carcass. 4,163,685, Cl. 156-405.00R.
Kubo, Kazuo; Ito, Noriki; Souzu, Isao; Isomura, Yasuo; and Homma, Hiroshige, to Yamanouchi Pharmaceutical Co., Ltd. Nitrogen-containing heterocyclic compounds. 4,163,844, Cl. 544-32.000.
Kuhla, Donald E., to Pfizer Inc. Imidazo[1,5-a]-quinolinium and imidazo[1,5-a]-pyridinium compounds. 4,163,745, Cl. 546-84.000.
Kulik, Metro D.; and Gorin, Everett, to Continental Oil Company. Process for stack gas desulfurization. 4,163,776, Cl. 423-567.000.
Kumiai Chemical Industry Co., Ltd.: *See*—
Jikihara, Kazuo; Itoh, Shigekazu; Takayama, Shuichi; Sato, Koichi; Kimura, Ichiro; and Chiyomaru, Isao, 4,163,661, Cl. 71-108.000.
Kundrath, Michael R.: *See*—
Warren, John B.; and Kundrath, Michael R., 4,163,900, Cl. 250-439.00R.
Kunin, Viktor S.: *See*—
Bykhovsky, David G.; Alexeev, Konstantin P.; Kunin, Viktor S.; Vassin, Valery M.; Nesterov, Valentin N.; Alexandrov, Vladimir A.; and Fomin, Eduard R., 4,163,402, Cl. 82-1.00C.
Kuo, Han C.; Geren, George W.; Corvin, Thomas E.; and Ahn, Byung K., to Olin Corporation. In situ reference electrode for diaphragm cells. 4,163,698, Cl. 204-1.00T.
Kupriyanov, Mikhail J.; Lapir, Gennady M.; Likharev, Konstantin K.; Semenov, Vasily K.; and Kandyba, Petr E. Film cryotron. 4,164,030, Cl. 365-162.000.
Kurochkin, Sergei F.: *See*—
Lapy, Viktor J.; Chernov, Boris P.; Georgizon, Evgeny B.; Koshevoi, Anatoly A.; Yavorsky, Gerald I.; Glaziev, Valentin I.; Rivkin, Boris S.; Yakushenkov, Andrei A.; and Kurochkin, Sergei F., 4,163,972, Cl. 343-7.00A.
Kuroda, Hiroshi: *See*—
Nakajima, Yasuo; Kuroda, Hiroshi; and Hayashi, Yoshimasa, 4,163,435, Cl. 123-119.00A.
Kurrle, Hermann; and Muller, Gottfried, to Schako Metallwarenfabrik Ferdinand Schad GmbH. Slotted outlet for the ventilation of interior spaces. 4,163,416, Cl. 98-40.00R.
Kurth, Thomas C., to Corning Glass Works. Controlling the drawing rollers to produce diameter perturbations in an optical waveguide. 4,163,370, Cl. 65-2.000.
Kvam, Donald C.: *See*—
Harrington, Joseph K.; Kvam, Donald C.; Mendel, Arthur; and Robertson, Jerry E., 4,163,659, Cl. 71-76.000.
Kwasman, Alan. Reader for hematocrit value. 4,163,615, Cl. 356-39.000.
Kwiatkowski, Joseph. Candle box. 4,163,333, Cl. 40-561.000.

La Spirotechnique, Industrielle et Commerciale: *See*—
Grouard, Gerard, 4,163,448, Cl. 128-142.200.
Laass, Heinz, to TACO-Tafel GmbH. Multi-function test apparatus to test, selectively and as desired, electrical circuits, circuit components and transistors. 4,163,937, Cl. 324-57.00R.
Labaw, Clifford S.; Webb, Robert L.; and Wellman, George R., to SK&F Lab Co. Process for preparing new imidazolemethylphosphonium salts. 4,163,858, Cl. 548-342.000.
Lachaussee, Maurice, to Etablissements Lachaussee, Societe Anonyme. Automatic control apparatus for a machine having successive work stations. 4,163,930, Cl. 318-563.000.
Laflaquiere, Regis; Janousek, Rade; and Faessler, Rene, to Societe Alsacienne de Constructions Mecaniques de Mulhouse. Rotary cylinder fitted with needles or teeth for the treatment of slivers of textile fibers. 4,163,304, Cl. 19-97.000.
Lalanne, Bruno: *See*—
Bezard, Jean-Jacques; Jourdain, Charles-Henri; and Lalanne, Bruno, 4,163,391, Cl. 73-295.000.
Lamb, Frank: *See*—
Randell, Donald R.; Hyde, Thomas G.; Lamb, Frank; Clubley, Brian G.; and Phillips, William D., 4,163,731, Cl. 252-78.500.
Lambe, John J.; and McCarthy, Shaun L., to Ford Motor Company. Solid state source of radiant energy having a controllable frequency spectra characteristic. 4,163,920, Cl. 313-503.000.
Lammlein, Robert A., Jr., to Goodyear Tire & Rubber Company, The. Forming a tire bead assembly. 4,163,683, Cl. 156-136.000.
Lange, Gerhard: *See*—
Schutz, Klaus; Helber, Holger; and Lange, Gerhard, 4,163,602, Cl. 358-113.000.
Langlois, Etienne: *See*—
Ernyei, Herbert; and Langlois, Etienne, 4,163,960, Cl. 333-198.000.
Lapir, Gennady M.: *See*—
Kupriyanov, Mikhail J.; Lapir, Gennady M.; Likharev, Konstantin K.; Semenov, Vasily K.; and Kandyba, Petr E., 4,164,030, Cl. 365-162.000.
Lapy, Viktor J.; Chernov, Boris P.; Georgizon, Evgeny B.; Koshevoi, Anatoly A.; Yavorsky, Gerald I.; Glaziev, Valentin I.; Rivkin, Boris S.; Yakushenkov, Andrei A.; and Kurochkin, Sergei F. Automatic shipboard collision avoidance system. 4,163,972, Cl. 343-7.00A.
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Olander, Emil E., Jr.; James, Rex L.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., 4,164,019, Cl. 364-710.000.
Olander, Emil E., Jr.; James, Rex L.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., 4,164,039, Cl. 364-709.000.
La Russa, Joseph A., to Farrand Optical Co., Inc. Optical image-forming apparatus with tilted bi-refringent elements. 4,163,542, Cl. 350-3.720.
Lass, John L., to Square D Company. Electrical outlet box and wall mounting clamp therefor. 4,163,501, Cl. 220-3.600.
Lauer, Hugh C.: *See*—
Randell, Brian; Kerr, Ronald; Melliar-Smith, Peter M.; Lauer, Hugh C.; and Horning, James J., 4,164,017, Cl. 364-200.000.
Lauzier, Rene, to Angenieux CLB S.A. Center-pull calliper brakes for bicycles and the like. 4,163,482, Cl. 188-24.000.
Lavis, Leon J. Power saws. 4,163,404, Cl. 83-165.000.
Lawn, Francis. Methods and apparatus for charging batteries. 4,163,934, Cl. 320-23.000.
Leder, Frederic. Forced convection heat exchanger for warming articles. 4,163,471, Cl. 165-80.00E.
Lee C. Moore Corporation: *See*—
Jenkins, Cecil, 4,163,625, Cl. 414-22.000.
Leeds & Northrup Company: *See*—
Robertson, Donald, 4,163,903, Cl. 250-554.000.
Leenhouts, Albert C., to Superior Electric Company, The. Numerical control system and method for a three axes movement. 4,163,932, Cl. 318-573.000.
Legrand, Francis, to Societe Nationale Industrielle Aerospatiale. Method and apparatus for steering a spacecraft and regulating its onboard supply voltage. 4,164,018, Cl. 364-424.000.
Legras, Jean-Pierre; and Marechal, Claude M., to Eastman Kodak Company. Magnetic recording elements and process of preparation. 4,163,823, Cl. 428-304.000.
Lenaerts, George V.; and Dragunevicius, Algirdas J., to Northern Telecom Limited. Molded plastic base plate for a telephone set. 4,163,874, Cl. 179-100.00R.
Leroy, Patrick: *See*—
Devos, Francis; Leroy, Patrick; and Huchette, Michel, 4,163,691, Cl. 435-174.000.
Les Industries BFG Limitee: *See*—
Drouin, Claude, 4,163,444, Cl. 126-198.000.
Lesnick, Alan F.; and Tarjan, Peter P., to Cordis Corporation. Interactive method and digitally timed apparatus for cardiac pacing arrhythmia treatment. 4,163,451, Cl. 128-419.0PG.
Levanti, August. Knife assembly. 4,163,317, Cl. 30-123.700.
Levine, Walter E., to Bindicator Company. Ultrasonic transducer with temperature stability due to selected damping materials and/or assembly methods. 4,163,917, Cl. 310-327.000.
Levy, Boris: *See*—
Eckert, Robert D.; Levy, Boris; and Mahoney, John B., 4,163,816, Cl. 427-401.000.
Lew, Jean S. Y., to ICI Americas Inc. Fluorinated sulfonamides. 4,163,754, Cl. 428-378.000.
Lewandowski, Joseph T.: *See*—
Horowitz, Harold S.; Longo, John M.; and Lewandowski, Joseph T., 4,163,706, Cl. 204-242.000.
Lewis/Howe Company: *See*—
Mitra, Arun K., 4,163,777, Cl. 424-21.000.
LGZ Landis & Gyr Zug AG: *See*—
Greenaway, David L., 4,163,570, Cl. 283-8.00A.
Lichtenberger, Gunter J., to Sun Oil Company, Ltd. Method and apparatus for increasing the vertical load bearing capacity of ice. 4,163,620, Cl. 405-217.000.
Liggett Group Inc.: *See*—
Kallianos, Andrew G.; and Simpson, Melvyn I., 4,163,453, Cl. 131-17.00R.
Likharev, Konstantin K.: *See*—
Kupriyanov, Mikhail J.; Lapir, Gennady M.; Likharev, Konstantin K.; Semenov, Vasily K.; and Kandyba, Petr E., 4,164,030, Cl. 365-162.000.
Likhogub, Evgeny P.: *See*—
Minasov, Alexandr N.; Likhogub, Evgeny P.; and Sergeev, Stanislav S., 4,163,694, Cl. 202-139.000.
Limozin, Henri; and Dalibout, Georges, to WABCO Westinghouse. Pneumatic railway braking distributor. 4,163,587, Cl. 303-22.00R.
Lin, Yeong S.: *See*—
Almasi, George S.; and Lin, Yeong S., 4,164,026, Cl. 365-3.000.
Lindauer, Thomas, to Pullman Inc. Hopper door locking and actuating mechanism. 4,163,424, Cl. 105-313.000.
Linn, Roy N., Jr. Video speed analyzer of golf club swing or the like. 4,163,941, Cl. 324-178.000.
LITA: *See*—
Vasseur, Bernard, 4,163,595, Cl. 339-88.00R.
Lobdell, Donn D., to Cobe Laboratories, Inc. Edge sealed pleated membrane. 4,163,721, Cl. 210-232.000.
Lock, John D.: *See*—
Hunter, William M.; and Lock, John D., 4,163,643, Cl. 23-230.00R.
Lockheed Corporation: *See*—
Masoner, Vernon W., 4,163,380, Cl. 72-342.000.
Longo, John M.: *See*—
Horowitz, Harold S.; Longo, John M.; and Lewandowski, Joseph T., 4,163,706, Cl. 204-242.000.
Lonsdale, Melvin J.: *See*—
Batterton, Elmo L.; and Lonsdale, Melvin J., 4,163,626, Cl. 414-469.000.
Lou, Perry W.; and Grant, Charles P., Jr., deceased (by Grant, Charles P., administrator), to Texas Instruments Incorporated. Memory system. 4,164,031, Cl. 365-233.000.
Lovelace, David F.: *See*—
Thompson, George H. B.; and Lovelace, David F., 4,163,952, Cl. 331-94.50H.
Lowell, Francis C.: *See*—
Ohman, John L.; and Lowell, Francis C., 4,163,778, Cl. 424-91.000.
Lubrizol Corporation, The: *See*—
Bryant, Charles P., 4,163,730, Cl. 252-34.700.
Lucarini, Francois, to Vibrax/MCA, Inc. Artificial fishing lure. 4,163,338, Cl. 43-42.170.
Lumma, William C., Jr.; Saari, Walfred S.; and Zacchei, Anthony G., to Merck & Co., Inc. Piperazinylpyrazines. 4,163,849, Cl. 544-357.000.
Lundahl, Ezra C.; and Wiser, J. Gordon, to Ezra C. Lundahl, Inc. Variable stack feeder and method. 4,163,524, Cl. 241-30.000.
Lyass, Abram M., deceased: *See*—
Zhukovsky, Sergie S.; Shadrin, Nikolai I.; Teplyakov, Sergei D.; Lyass, Abram M., deceased; and Lyass, Inna E., administrator, 4,163,741, Cl. 260-33.40R.
Lyass, Inna E., administrator: *See*—
Zhukovsky, Sergie S.; Shadrin, Nikolai I.; Teplyakov, Sergei D.; Lyass, Abram M., deceased; and Lyass, Inna E., administrator, 4,163,741, Cl. 260-33.40R.
MA.CO S.a.s. di Saso Vittorio & C.: *See*—
Risi, Roberto, 4,163,686, Cl. 156-492.000.
MacDonald, Robert D.; Rose, Robert K.; and Papsdorf, John W., to Du Pont de Nemours, E. I., and Company. Internally finned tube. 4,163,474, Cl. 165-179.000.
Maciorewicz, Jacek J.; Richters, Johannes J.; and St. John, James E., to Elast-O-Cor Products & Engineering Limited. Hydrocyclone separator arrangement. 4,163,719, Cl. 210-84.000.
Madison, Norman L.: *See*—
Chamberlin, Thomas A.; and Madison, Norman L., 4,163,718, Cl. 210-54.000.
Maeda, Hiroshi: *See*—
Ishida, Nakao; Suzuki, Fujio; Maeda, Hiroshi; Fujii, Toshikatsu; and Mizutani, Ituro, 4,163,780, Cl. 424-116.000.
Maeda, Toshiyuki: *See*—
Sakamaki, Hiroshi; Maeda, Toshiyuki; Sakai, Toshimitsu; and Saitou, Tadashi, 4,163,635, Cl. 418-236.000.
Maffrand, Jean-Pierre: *See*—
Ferrand, Gerard; and Maffrand, Jean-Pierre, 4,163,852, Cl. 546-114.000.
Maggi, Charles R., to International Telephone and Telegraph Corporation. Digital CVSD telephone conference circuit. 4,163,871, Cl. 179-1.0CN.
Maguire, Justin M., Jr.; and Edwards, Thomas M., to Hauserman, Inc. Light fixture. 4,164,009, Cl. 362-127.000.
Mahler, Gert; Viertel, Lothar; and Meissner, Wolfgang, to Gebr. Happich GmbH. Reinforcing insert for a sunvisor for vehicles. 4,163,579, Cl. 296-97.00H.
Mahoney, Dennis M., to Union Carbide Corporation. Parylene stabilization. 4,163,828, Cl. 428-411.000.

Mahoney, John B.: *See—*
Eckert, Robert D.; Levy, Boris; and Mahoney, John B., 4,163,816, Cl. 427-401.000.

Malassine, Bernard P.; Gautier, Jean-Claude C.; Chevalier, Sammy H.; and Berteleau, Gerard R., to Societe Nationale des Poudres et Explosifs. Process for the preparation of polystyrylpyridine. 4,163,740, Cl. 260-31.20N.

Malhotra, Sudarshan K.; and Ricks, Michael J., to Dow Chemical Company, The. Substituted pyridine methyl esters of cyclopropane carboxylic acids and their use as insecticides. 4,163,787, Cl. 424-263.000.

Malinski, S. W.: *See—*
Mueller, Thomas L., 4,163,468, Cl. 157-1.170.

Mamers, Heikki; and Rowney, John E., to Commonwealth Scientific and Industrial Research Organization. Method and apparatus for explosively defibrating cellulosic fiber. 4,163,687, Cl. 162-21.000.

Manning Environmental Corp.: *See—*
Fleenor, Richard P.; and Deeds, M. Rinley, 4,163,392, Cl. 73-421.00B.

Mannor, Arden, to Carthage Cup Company. Disposable cup dispenser. 4,163,508, Cl. 221-310.000.

Mansure, Jacob F., to Du Pont de Nemours, E. I., and Company. Process and product prepared from tetrafluoroethylene resin and graphite fibers. 4,163,742, Cl. 260-42.170.

Marcmann, Emil. Method and apparatus for securing insulation panels to a structure to be insulated thereby. 4,163,347, Cl. 52-105.000.

Marechal, Claude M.: *See—*
Legras, Jean-Pierre; and Marechal, Claude M., 4,163,823, Cl. 428-304.000.

Maruta, Rikio: *See—*
Nishitani, Takao; and Maruta, Rikio, 4,164,021, Cl. 364-726.000.

Marvin Glass & Associates: *See—*
Jaworski, Eugene; and Breslow, Jeffrey D., 4,163,558, Cl. 273-115.000.

Marzluf, Werner: *See—*
Botsch, Bertram; and Marzluf, Werner, 4,163,636, Cl. 415-6.000.

Marzluff, William F.: *See—*
Fetchin, John A.; and Marzluff, William F., 4,163,735, Cl. 252-443.000.

Maschinenfabrik Hellmut Geiger: *See—*
Botsch, Bertram; and Marzluf, Werner, 4,163,636, Cl. 415-6.000.

Mashimo, Yukio: *See—*
Sakurada, Nobuaki; Mashimo, Yukio; Ito, Tadashi; Ito, Fumio; and Shinoda, Nobuhiko, 4,163,935, Cl. 324-29.500.

Masoner, Vernon W., to Lockheed Corporation. Forming of preconsolidated metal matrix composites. 4,163,380, Cl. 72-342.000.

Matson, Charles B., to Cincinnati Milacron Inc. Grinding machine control. 4,163,346, Cl. 51-165.770.

Matsubara, Toru: *See—*
Tsuchiya, Shozo; Hayashi, Hideo; Sasaki, Makoto; Goto, Kiyoshi; and Matsubara, Toru, 4,163,763, Cl. 525-290.000.

Matsuda, Ken; Butensky, Martin S.; Tsu, Kin H.; and Munch, Robert J., to American Cyanamid Company. Processing of acrylamide solutions; concentration without polymer formation. 4,163,755, Cl. 260-561.00N.

Matsumoto, Nobuo, to Nippon Telegraph and Telephone Public Corporation. Semiconductor laser device. 4,163,976, Cl. 331-94.50H.

Matsuno, Takeshi; Nishiyama, Fumiya; and Kobayashi, Takeshi, to Seiko Seiki Kabushiki Kaisha. Transfer machine. 4,163,313, Cl. 29-563.000.

Matsushita Electric Industrial Co., Ltd.: *See—*
Miki, Sukeichi; Ninomiya, Shuichi; Fukuda, Shin; and Sugimoto, Yukio, 4,163,943, Cl. 325-433.000.

Matsushita Electric Works, Ltd.: *See—*
Sauer, Hans, 4,163,314, Cl. 29-593.000.

Matthews, Francis T.; and Bozzuto, Carl R., to Combustion Engineering, Inc. Vapor generator and MHD power plant. 4,163,910, Cl. 310-11.000.

Maulden, Kerry A.: *See—*
Burkhart, L. Elkin; Fultz, Chester R.; and Maulden, Kerry A., 4,163,516, Cl. 228-114.000.

Mauri, Jacinto M.; Vega-Noverola, Armando; and Spickett, Robert G. W., to Anphar, S.A. Anti-psychotic (cycloalkenylalkylpiperidino) benzamides. 4,163,789, Cl. 424-267.000.

Max-Planck-Gesellschaft zur Forderung der Wissenschaften E.V.: *See—*
Eibl, Hansjorg; and Nicksch, Alfar, 4,163,748, Cl. 260-403.000.

Mayer, Robert W.; and Smorzaniuk, Adam, to Amerace Corporation. Selector switch. 4,163,879, Cl. 200-11.0TW.

Mazziotti, Philip J.: *See—*
Guenther, William D.; and Mazziotti, Philip J., 4,163,438, Cl. 123-190.00A.

McAvinn, James D.; and Patel, Harish A., to Kendall Company, The. Wet dressing heating system. 4,163,896, Cl. 219-525.000.

McCarroll, John J.: *See—*
Foster, Alan I.; James, Peter G.; McCarroll, John J.; and Tennison, Stephen R., 4,163,775, Cl. 423-363.000.

McCartan, Daniel A.: *See—*
Finn, Lawrence R.; McCartan, Daniel A.; and Schmandt, Gary M., 4,163,353, Cl. 53-430.000.

McCarthy, Shaun L.: *See—*
Lambe, John J.; and McCarthy, Shaun L., 4,163,920, Cl. 313-503.000.

McCumber, Donald D. Pivotable trailer hitch. 4,163,568, Cl. 280-491.00B.

McDonough, Edward C.; and Tuley, Eugene N., to United States of America, Air Force. Turbine vane construction. 4,163,629, Cl. 415-115.000.

McEwen, William D. Pharmacist's prescription file holder. 4,163,497, Cl. 211-11.000.

McGarry, Errol J.; and Forsyth, Bruce A., to ICI Australia Limited. Treatment of animals with 2,6-bis(2-hydroxybenzyl)phenols to eradicate trematodes. 4,163,801, Cl. 424-347.000.

McGinnis, William J., Jr.: *See—*
Bonnie, G. Patrick; and McGinnis, William J., Jr., 4,164,027, Cl. 365-15.000.

McGinniss, Vincent D.; Ting, Vincent W.; and Kah, Ann F., to SCM Corporation. Radiation polymerization of polymeric binder coating compositions. 4,163,809, Cl. 427-44.000.

McGinniss, Vincent D., to SCM Corporation. Ultraviolet curable powder paints. 4,163,810, Cl. 427-54.000.

McKinnon, Robert M., to D/FW Plastics, Inc. Lid and housing. 4,163,503, Cl. 220-18.000.

McLellan, Norvel J. Moving target practice range. 4,163,557, Cl. 273-101.100.

Medlar, Lewis A.; and Newbold, William F., to Honeywell Inc. Pressure transmitter with simplified pressure sensing head. 4,163,395, Cl. 73-708.000.

Meili, Max, to AG fur Automatisierung. Arrangement for the grinding of rotary profile cutters. 4,163,345, Cl. 51-33.00W.

Meissner, Wolfgang: *See—*
Mahler, Gert; Viertel, Lothar; and Meissner, Wolfgang, 4,163,579, Cl. 296-97.00H.

Melliar-Smith, Peter M.: *See—*
Randell, Brian; Kerr, Ronald; Melliar-Smith, Peter M.; Lauer, Hugh C.; and Horning, James J., 4,164,017, Cl. 364-200.000.

Mendel, Arthur: *See—*
Harrington, Joseph K.; Kvam, Donald C.; Mendel, Arthur; and Robertson, Jerry E., 4,163,659, Cl. 71-76.000.

Mercer, Gerald D.: *See—*
Buckman, John D.; Mercer, Gerald D.; and Pera, John D., 4,163,733, Cl. 252-180.000.

Merck & Co., Inc.: *See—*
Cragoe, Edward J., Jr.; and Woltersdorf, Otto W., Jr., 4,163,781, Cl. 424-200.000.
Cragoe, Edward J., Jr.; and Woltersdorf, Otto W., Jr., 4,163,794, Cl. 424-285.000.
Jackman, Kristina R., 4,163,807, Cl. 426-599.000.
Lumma, William C., Jr.; Saari, Walfred S.; and Zacchei, Anthony G., 4,163,849, Cl. 544-357.000.

Merrin, Seymour: *See—*
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Merten, Rudolf: *See—*
Giesecke, Henning; Hocker, Jurgen; and Merten, Rudolf, 4,163,857, Cl. 548-318.000.

Messerschmitt-Bolkow-Blohm GmbH: *See—*
Bschorr, Oskar, 4,163,479, Cl. 181-286.000.
Weiland, Emil, 4,163,630, Cl. 416-134.00A.

Metallgesellschaft Aktiengesellschaft: *See—*
Papendick, Klaus; and Peter, Lothar, 4,163,307, Cl. 29-25.190.

Meyer Morton Co.: *See—*
Batterton, Elmo L.; and Lonsdale, Melvin J., 4,163,626, Cl. 414-469.000.

Meyer, Robert H.; Graham, Charles I.; Rudolph, John E.; and Haas, Robert E., to Beatrice Foods Co. Thermoplastic composition derived from animal parts and methods for production thereof. 4,163,804, Cl. 426-315.000.

Meyer, Roth & Pastor Maschinenfabrik GmbH: *See—*
Windelbandt, Herbert; and Ditges, Gunter, 4,163,363, Cl. 59-27.000.

Meyer, Stanley M.: *See—*
Miller, Garry E.; and Dalke, Michael, 4,164,008, Cl. 362-103.000.

Meyer, Willy; Drabek, Jozef; Gsell, Laurenz; and Karrer, Friedrich, to Ciba-Geigy Corporation. Insecticidal oxadiazole esters. 4,163,792, Cl. 424-272.000.

Michaels of Oregon Co.: *See—*
Ives, Robert K., 4,163,335, Cl. 42-83.000.

Michaux, Jean-Pierre, to Compagnie Francaise de Raffinage. Process for obtaining isobutylene of a purity higher than 99.5 weight percent. 4,163,697, Cl. 203-49.000.

MicroVue Products Inc.: *See—*
Hall, Peter J., 4,163,611, Cl. 353-101.000.

Midden, William E.: *See—*
Krenzer, Orville; Midden, William E.; and Schmid, Charles F., 4,163,529, Cl. 242-85.100.

Mikado, Tsuneo, to Nippon Television Industry Corporation. Television time signal generator. 4,163,361, Cl. 58-50.00R.

Mikami, Takeshi: *See—*
Inoue, Atsuo; and Mikami, Takeshi, 4,163,671, Cl. 96-74.000.

Miki, Sukeichi; Ninomiya, Shuichi; Fukuda, Shin; and Sugimoto, Yukio, to Matsushita Electric Industrial Co., Ltd. Radio receiver employing premixing and digital display. 4,163,943, Cl. 325-433.000.

Milberger, Ernest C.: *See—*
Dolhyj, Serge R.; and Milberger, Ernest C., 4,163,862, Cl. 562-534.000.

Miller, Benson L.; and Helesfai, Steven, to Sargent & Greenleaf, Inc. Tumbler wheel combination locks with torque adjuster means. 4,163,376, Cl. 70-303.00A.

Miller, Garry E.; and Dalke, Michael, to Meyer, Stanley M.; and Schwartz, Barbara, part interest to each. Illuminated article of clothing. 4,164,008, Cl. 362-103.000.

Miller, Imrich; and Freimuth, Lothar, to Universal Manufacturing Corporation. Coil winding apparatus. 4,163,531, Cl. 242-158.00R.
Milo, August, to Universal Valve Co., Inc. Test plug. 4,163,462, Cl. 138-90.000.
Minasov, Alexandr N.; Likhogub, Evgeny P.; and Sergeev, Stanislav S. Heating wall for coke ovens. 4,163,694, Cl. 202-139.000.
Mini, Joseph R.: *See*—
Morin, John O.; and Mini, Joseph R., 4,163,971, Cl. 340-754.000.
Minnesota Mining and Manufacturing Company: *See*—
Aysta, James E.; and Goff, Dewain R., 4,163,596, Cl. 339-97.00P.
Harrington, Joseph K.; Kvam, Donald C.; Mendel, Arthur; and Robertson, Jerry E., 4,163,659, Cl. 71-76.000.
Patterson, Richard A., 4,163,506, Cl. 220-260.000.
Wear, Robert L., 4,163,834, Cl. 525-534.000.
Minolta Camera Kabushiki Kaisha: *See*—
Ueda, Hiroshi; Miyamoto, Takayoshi; and Niwa, Masatake, 4,163,612, Cl. 354-152.000.
Misinchuk, Peter D. Electrical dimmer plug. 4,163,965, Cl. 338-220.000.
Mitra, Arun K., to Lewis/Howe Company. Controlled antacid delivery form and method of treatment therewith. 4,163,777, Cl. 424-21.000.
Mitsubishi Gas Chemical Company, Inc.: *See*—
Ikarashi, Takeo; Goto, Mikio; Sano, Kozo; Osaki, Naoto; Aoyama, Tetsuo; and Horie, Shigeru, 4,163,863, Cl. 568-798.000.
Mitsubishi Jidosha Kogyo Kabushiki Kaisha: *See*—
Tsukamoto, Yutaka; and Takamiya, Bonnosuke, 4,163,434, Cl. 123-119.00D.
Mitsubishi Paper Mills, Ltd.: *See*—
Kanada, Eiji; Itoh, Noboru; Ikeda, Hiroshi; and Iwata, Tamotsu, 4,163,669, Cl. 96-74.000.
Mitsui Engineering & Shipbuilding Co., Ltd.: *See*—
Shirato, Takeshi; and Teshima, Kiyomi, 4,163,364, Cl. 60-39.020.
Mitsui-Nisso Corporation: *See*—
Asai, Kiyotsugu; Takaguchi, Kazunori; Kawabata, Toshihiko; Yatsugi, Shigeru; and Ichikawa, Toshiyuki, 4,163,814, Cl. 427-372.00R.
Miyakawa Industry Company, Limited: *See*—
Kitagawa, Toshikatsu, 4,163,623, Cl. 408-46.000.
Miyake, Masayoshi: *See*—
Kawaguchi, Munetaka; and Miyake, Masayoshi, 4,163,826, Cl. 428-371.000.
Miyamoto, Takayoshi: *See*—
Ueda, Hiroshi; Miyamoto, Takayoshi; and Niwa, Masatake, 4,163,612, Cl. 354-152.000.
Miyashita, Masanori: *See*—
Kato, Takayuki; Sumi, Kazumasa; Miyashita, Masanori; Nomura, Osamu; and Naito, Shouzo, 4,163,385, Cl. 73-35.000.
Miyazaki, Kunio: *See*—
Yamada, Youji; Miyazaki, Kunio; and Hamane, Masumi, 4,163,399, Cl. 74-700.000.
Miyazaki, Teruko U.: *See*—
Blackwell, Joseph T., III; Gupton, John T.; Miyazaki, Teruko U.; Nabors, James B.; and Pociask, Joseph R., 4,163,848, Cl. 544-319.000.
Mizumura, Motoo: *See*—
Aihara, Shigenobu; Haga, Isao; and Mizumura, Motoo, 4,163,951, Cl. 331-1.00A.
Mizutani, Ituro: *See*—
Ishida, Nakao; Suzuki, Fujio; Maeda, Hiroshi; Fujii, Toshikatsu; and Mizutani, Ituro, 4,163,780, Cl. 424-116.000.
Moczygemba, George A., to Phillips Petroleum Company. Polymeric compositions. 4,163,765, Cl. 525-314.000.
Mohacsi, Ernest, to Hoffmann-La Roche Inc. 1-(P-phenoxy)benzyl-1,2,3,4,5,6,7,8-octahydroisoquinolines. 4,163,853, Cl. 546-149.000.
Molitorisz, Joseph. Rotary compacting machine for fibrous aterial. 4,163,419, Cl. 100-89.000.
Monarch Marking Systems, Inc.: *See*—
Hamisch, Paul H., Jr., 4,163,422, Cl. 101-111.000.
Monneraye, Marc A.; and Monnier, Michel J. C., to U.S. Philips Corporation. Method of manufacturing a lead-through of a metal element through a ceramic component by means of sealing. 4,163,656, Cl. 65-43.000.
Monnier, Michel J. C.: *See*—
Monneraye, Marc A.; and Monnier, Michel J. C., 4,163,656, Cl. 65-43.000.
Monsanto Company: *See*—
Yung, Kai-Lim W.; and Silverman, Bernard, 4,163,819, Cl. 428-198.000.
Montgomery, Francis E.; Short, James E., Jr.; and Weaver, William J., to United States of America, Navy. Method for disposing of red phosphorus composition. 4,163,682, Cl. 149-108.400.
Moore, James O., to Moore Products Co. Calibrating device for control stations and indicators. 4,163,938, Cl. 324-74.000.
Moore Products Co.: *See*—
Moore, James O., 4,163,938, Cl. 324-74.000.
Moore, Stanley R.; Crisman, Thomas L.; and Zivney, Donald R., to Freeze Sleeves of America, Inc. Refrigeratable beverage container holder. 4,163,374, Cl. 62-457.000.
Moreau, Marc, to Trefimetaux. Continuous hydrostatic extrusion process and apparatus. 4,163,377, Cl. 72-60.000.
Morin, John O.; and Mini, Joseph R., to Sigma Instruments Inc. Systems for displaying analog values. 4,163,971, Cl. 340-754.000.
Morita, Eiichi; Ejiri, Hirosaburo; Takayanagi, Keizo; Morita, Yukio; Tanaka, Yasuhide; Kijima, Shizumasa; Hamamura, Kimio; and Yamatsu, Isao, to Eisai Co., Ltd. Process for preparing 2-methyl-2-prenyl-4,5,6-trimethoxyphenol. 4,163,864, Cl. 568-628.000.
Morita, Yukio: *See*—
Morita, Eiichi; Ejiri, Hirosaburo; Takayanagi, Keizo; Morita, Yukio; Tanaka, Yasuhide; Kijima, Shizumasa; Hamamura, Kimio; and Yamatsu, Isao, 4,163,864, Cl. 568-628.000.
Morris AG: *See*—
Hagmann, Peter; and Muller, Ernst, 4,163,316, Cl. 30-47.000.
Morris, John C.; Weidman, James K.; and Prior, Michael D. Apparatus for applying granular refractory material to surfaces. 4,163,546, Cl. 266-281.000.
Morrison, Bertram L.: *See*—
Fowler, James M.; and Morrison, Bertram L., 4,163,544, Cl. 251-328.000.
Morrison, Cameron E.: *See*—
Chambers, Ramon P.; Gordy, Robert S.; Sanders, David E.; and Morrison, Cameron E., 4,163,944, Cl. 325-446.000.
Motor Wheel Corporation: *See*—
Snyder, Robert C., 4,163,586, Cl. 303-20.000.
Motorola, Inc.: *See*—
Dailing, James L., 4,163,959, Cl. 333-191.000.
Price, John J., 4,163,908, Cl. 307-296.00R.
Mounce, George R. Rodent repellor. 4,163,966, Cl. 340-15.000.
Mourgue, Pascal N., to Societe Anonyme des Ateliers Marcadet Mobilier. Bearer structure for assembling modular elements. 4,163,537, Cl. 248-188.100.
Muanyagipari Kutato Intezet: *See*—
Kecskemethy, Geza; Virag, Gyorgy; Tihanyi, Robert; and Czirmai, Zoltan, 4,163,511, Cl. 222-144.500.
Mueller, Hans, to PEC Process Engineering Company SA. Apparatus for the biological purification of waste water. 4,163,720, Cl. 210-197.000.
Mueller, Richard A., to SCM Corporation. Reconstituted food product. 4,163,805, Cl. 426-575.000.
Mueller, Thomas L., to Malinski, S. W. Pivoted suspension for linear actuators of tire changing apparatus and the like. 4,163,468, Cl. 157-1.170.
Mullaney, John J., to Sealol, Inc. Rotary bellows seal with vibration-damping means. 4,163,563, Cl. 277-88.000.
Muller, Ernst: *See*—
Hagmann, Peter; and Muller, Ernst, 4,163,316, Cl. 30-47.000.
Muller, Gottfried: *See*—
Kurrle, Hermann; and Muller, Gottfried, 4,163,416, Cl. 98-40.00R.
Muller, Hans; and Sotirianos, Konstantin, to Chemap AG. Pressure filter and process for cleaning it. 4,163,724, Cl. 210-323.00T.
Muller, Peter: *See*—
Windemuth, Erwin; Dahm, Manfred; Dietrich, Manfred; and Muller, Peter, 4,163,830, Cl. 521-111.000.
Multimould Enterprises Pty. Ltd.: *See*—
Thelander, Keith, 4,163,418, Cl. 99-374.000.
Munch, Robert J.: *See*—
Matsuda, Ken; Butensky, Martin S.; Tsu, Kin H.; and Munch, Robert J., 4,163,755, Cl. 260-561.00N.
Murakami, Kyoichi: *See*—
Akazawa, Susumu; Murakami, Kyoichi; Ishihata, Kiyoshi; and Tsuchiya, Takao, 4,163,989, Cl. 358-27.000.
Muraoka, Teruo: *See*—
Ishigaki, Yukinobu; and Muraoka, Teruo, 4,163,945, Cl. 325-473.000.
Murase, Ichiki: *See*—
Sano, Takezo; Shimomura, Takatoshi; Sasaki, Masao; Murase, Ichiki; and Hirakawa, Manabu, 4,163,725, Cl. 210-490.000.
Murata Kikai Kabushiki Kaisha: *See*—
Honjo, Takeshige, 4,163,359, Cl. 57-93.000.
Murata, Moriyasu: *See*—
Sai, Fumio; and Murata, Moriyasu, 4,163,732, Cl. 252-99.000.
Murata, Yasuyuki, to Electroplating Engineers of Japan, Ltd. Apparatus for selectively plating rectangular sheet continuously or intermittently. 4,163,704, Cl. 204-206.000.
Musaph, Freddy W. X-ray apparatus comprising beam shaping restrictor plate having key-shaped gap. 4,163,902, Cl. 250-482.000.
Musashisemitsukoguo Kabushikikaisha: *See*—
Nemoto, Akira, 4,163,617, Cl. 403-132.000.
Myers, Herman L., to Raytheon Company. Internally vaned tube construction. 4,163,921, Cl. 315-39.510.
Nabors, James B.: *See*—
Blackwell, Joseph T., III; Gupton, John T.; Miyazaki, Teruko U.; Nabors, James B.; and Pociask, Joseph R., 4,163,848, Cl. 544-319.000.
Nachtigal, Paul. Combination calculator and time billing device. 4,164,038, Cl. 364-705.000.
Nagae, Yoshio; and Utsumi, Takashi, to Oxy Metal Industries Corporation. Aluminum treatment with alkaline solution and tannin. 4,163,679, Cl. 148-6.270.
Nagai, Hiroyoshi: *See*—
Terai, Kiyohide; and Nagai, Hiroyoshi, 4,163,890, Cl. 219-121.0EB.
Naito, Shouzo: *See*—
Kato, Takayuki; Sumi, Kazumasa; Miyashita, Masanori; Nomura, Osamu; and Naito, Shouzo, 4,163,385, Cl. 73-35.000.
Nakajima, Yasuo; Kuroda, Hiroshi; and Hayashi, Yoshimasa, to Nissan Motor Company, Limited. Exhaust gas recirculation control system. 4,163,435, Cl. 123-119.00A.
Nakano, Jiro: *See*—
Nohira, Hidetaka; Kobashi, Kiyoshi; and Nakano, Jiro, 4,164,032, Cl. 364-431.000.
Nannini, Giorgio. Auxiliary lenses unit for glasses. 4,163,607, Cl. 351-47.000.

Nash, David D., to Durapipe Limited. Pipe couplings. 4,163,571, Cl. 285-106.000.

Nash, Larry L., to Phillips Petroleum Company. Coupled block copolymers with improved tack for adhesives. 4,163,764, Cl. 525-2.000.

National Petro Chemicals Corporation: *See*—
Romano, Giuliano; and Rismondo, Michael A., 4,163,723, Cl. 210-319.000.

National Research Development Corporation: *See*—
Fong, William, 4,163,915, Cl. 310-198.000.
Hunter, William M.; and Lock, John D., 4,163,643, Cl. 23-230.00R.
Randell, Brian; Kerr, Ronald; Melliar-Smith, Peter M.; Lauer, Hugh C.; and Horning, James J., 4,164,017, Cl. 364-200.000.

Nayland, William R., to Burroughs Corporation. Apparatus and method for detecting non-alignment of a magnetic head with respect to a recording track on a record medium. 4,163,995, Cl. 360-76.000.

NCR Corporation: *See*—
Chambers, Ramon P.; Gordy, Robert S.; Sanders, David E.; and Morrison, Cameron E., 4,163,944, Cl. 325-446.000.

Neefe, Charles W. Hydratable gas permeable methyl methacrylate copolymer. 4,163,608, Cl. 351-160.00H.

Neefe, Charles W. Self cleaning contact lens. 4,163,609, Cl. 351-160.00H.

Neeff, Rutger: *See*—
Schroeder, Bernd; Braden, Rudolf; Auge, Wolfgang; Thiem, Karl-Werner; and Neeff, Rutger, 4,163,747, Cl. 260-378.000.

Neese, Wayne E., to GTE Automatic Electric Laboratories Incorporated. Method for forming universal film resistors. 4,163,315, Cl. 29-620.000.

Neff, Josef. Apparatus for resurfacing a snow layer. 4,163,329, Cl. 37-10.000.

Nelson, George H., to George Nelson & Company. Furniture units with L-shaped panel supports. 4,163,592, Cl. 312-194.000.

Nemoto, Akira, to Musashisemitsukoguo Kabushikikaisha. Ball joint. 4,163,617, Cl. 403-132.000.

Nesterov, Valentin N.: *See*—
Bykhovsky, David G.; Alexeev, Konstantin P.; Kunin, Viktor S.; Vassin, Valery M.; Nesterov, Valentin N.; Alexandrov, Vladimir A.; and Fomin, Eduard R., 4,163,402, Cl. 82-1.00C.

Neumann, Arthur E.: *See*—
Rumer, David O., Jr.; Findlay, Donald J.; Neumann, Arthur E.; and del Castillo, Juan M., 4,163,409, Cl. 84-484.000.

Neumann, Siegmar R. Heat recovery and filter system and process for furnace exhaust gases. 4,163,430, Cl. 122-20.00B.

Neumark, Otto W., to Beaufort Air Sea Equipment Limited. Mattress. 4,163,297, Cl. 5-446.000.

Neveux, Rene E., to Societe Anonyme Francaise du Ferodo. Ventilation device. 4,163,415, Cl. 98-2.090.

Newbold, William F.: *See*—
Medlar, Lewis A.; and Newbold, William F., 4,163,395, Cl. 73-708.000.

NGK Insulators, Ltd.: *See*—
Higuchi, Noboru; and Futamura, Shoji, 4,163,640, Cl. 425-466.000.

Nicksch, Alfar: *See*—
Eibl, Hansjorg; and Nicksch, Alfar, 4,163,748, Cl. 260-403.000.

Nieman, John R.; and Sanders, S. David, to Caterpillar Tractor Co. Method of making a wrapped innoculation rod suitable for modifying the composition of molten metals. 4,163,827, Cl. 428-377.000.

Niemand Bros., Inc.: *See*—
Kappler, Hermann; and Chezek, Norman A., 4,163,517, Cl. 229-45.000.

Nienart, Louis F.; Sellers, Gregory J.; Bretts, Gerald R.; and Timan, Dirk A., to Allied Chemical Corporation. Adhesive bonding of metallic glass fabric. 4,163,821, Cl. 428-245.000.

Ninomiya, Shuichi: *See*—
Miki, Sukeichi; Ninomiya, Shuichi; Fukuda, Shin; and Sugimoto, Yukio, 4,163,943, Cl. 325-433.000.

Nippon Electric Co., Ltd.: *See*—
Aihara, Shigenobu; Haga, Isao; and Mizumura, Motoo, 4,163,951, Cl. 331-1.00A.
Inaba, Masao; and Kashigi, Kazuo, 4,163,992, Cl. 358-183.000.
Nishitani, Takao; and Maruta, Rikio, 4,164,021, Cl. 364-726.000.

Nippon Electronics Memory Industry Co., Ltd.: *See*—
Shimamura, Hironori, 4,163,906, Cl. 307-39.000.

Nippon Kogaku K.K.: *See*—
Hasegawa, Hiroshi; and Goto, Tetsuro, 4,163,924, Cl. 315-241.00P.
Tsunashima, Teruyoshi, 4,163,603, Cl. 350-214.000.

Nippon Oil Company, Limited: *See*—
Tsuchiya, Shozo; Hayashi, Hideo; Sasaki, Makoto; Goto, Kiyoshi; and Matsubara, Toru, 4,163,763, Cl. 525-290.000.

Nippon Piston Ring Kabushiki Kaisha: *See*—
Sakamaki, Hiroshi; Maeda, Toshiyuki; Sakai, Toshimitsu; and Saitou, Tadashi, 4,163,635, Cl. 418-236.000.

Nippon Telegraph and Telephone Public Corporation: *See*—
Matsumoto, Nobuo, 4,163,976, Cl. 331-94.50H.

Nippon Television Industry Corporation: *See*—
Mikado, Tsuneo, 4,163,361, Cl. 58-50.00R.

Nishikawa, Kohji: *See*—
Baba, Takashi; Kawaguchi, Hiroshi; and Nishikawa, Kohji, 4,163,483, Cl. 188-71.800.

Nishina, Shuho: *See*—
Kondo, Yutaka; and Nishina, Shuho, 4,163,530, Cl. 242-107.100.

Nishitani, Takao; and Maruta, Rikio, to Nippon Electric Co., Ltd. 2M-point discrete Fourier transform calculator comprising a preprocessor for twice performing extraction of conjugate symmetric and/or antisymmetric components. 4,164,021, Cl. 364-726.000.

Nishiyama, Fumiya: *See*—
Matsuno, Takeshi; Nishiyama, Fumiya; and Kobayashi, Takeshi, 4,163,313, Cl. 29-563.000.

Nissan Motor Company, Limited: *See*—
Fujishiro, Takeshi, 4,163,433, Cl. 123-119.0EC.
Ishikawa, Masao, 4,163,428, Cl. 116-288.000.
Nakajima, Yasuo; Kuroda, Hiroshi; and Hayashi, Yoshimasa, 4,163,435, Cl. 123-119.00A.
Suzuki, Suzuo, 4,163,389, Cl. 73-194.00F.

Niwa, Masatake: *See*—
Ueda, Hiroshi; Miyamoto, Takayoshi; and Niwa, Masatake, 4,163,612, Cl. 354-152.000.

Nogami, Tomoyuki, to Toyota Jidosha Kogyo Kabushiki Kaisha. Fluid pressure control device for vehicle braking systems. 4,163,588, Cl. 303-24.00C.

Nogradi, Mihaly: *See*—
Feuer, Laszlo; Farkas, Lorand; Nogradi, Mihaly; Vermes, Borbala; Gottsegen, Agnes; and Wolfner, Andras, 4,163,746, Cl. 260-345.200.

Nohira, Hidetaka; Kobashi, Kiyoshi; and Nakano, Jiro, to Toyota Jidosha Kogyo Kabushiki Kaisha. Computer control of an exhaust gas recirculation device for an internal combustion engine. 4,164,032, Cl. 364-431.000.

Nomura, Osamu: *See*—
Kato, Takayuki; Sumi, Kazumasa; Miyashita, Masanori; Nomura, Osamu; and Naito, Shouzo, 4,163,385, Cl. 73-35.000.

Northern Telecom Limited: *See*—
Cogan, Fredrick T., 4,163,875, Cl. 179-103.000.
Dupuis, Jean M., 4,163,487, Cl. 198-383.000.
Lenaerts, George V.; and Dragunevicius, Algirdas J., 4,163,874, Cl. 179-100.00R.
Springthorpe, Anthony J.; and Dyment, John C., 4,163,953, Cl. 331-94.50H.

Norton Company: *See*—
Swiatek, Henry J., 4,163,647, Cl. 51-295.000.

Norwalt, Robert H.; Hibbert, Edward R.; and Schiff, Vicki L., to Sega Corporation. Slot car game with spin-out recovery capability. 4,163,555, Cl. 273-86.00B.

Notaras, Angelo L.: *See*—
Notaras, John A.; Notaras, Angelo L.; and Williams, James P., 4,163,437, Cl. 123-148.00E.

Notaras, John A.; Notaras, Angelo L.; and Williams, James P., to Solo Industries Pty. Limited. Transistor ignition circuit. 4,163,437, Cl. 123-148.00E.

November, Milton H., to International Telephone and Telegraph Corporation. Calorimeter. 4,163,388, Cl. 73-190.0CV.

Nuss, George W., Jr.: *See*—
Klein, Robert W.; and Nuss, George W., Jr., 4,163,783, Cl. 424-245.000.

Nystrand, Ernst D., to Paper Converting Machine Company. Method of lapping webs and product. 4,163,548, Cl. 270-39.000.

O'Brien, Merrill N., Jr., to Teepak, Inc. Oxazoline wax impregnated sausage casing. 4,163,463, Cl. 138-118.100.

Occidental Oil Shale, Inc.: *See*—
Cha, Chang Y.; and Bartel, William J., 4,163,475, Cl. 166-251.000.

Occidental Petroleum Corporation: *See*—
Green, Norman W., 4,163,693, Cl. 201-22.000.

Ohman, John L.; and Lowell, Francis C., to Foundation for the Study of Asthma and Related Diseases, The. Asthma immunotherapy. 4,163,778, Cl. 424-91.000.

Ohnuki, Nobutaka, to Hitachi, Ltd. Electro-acoustic transducer with variable thickness foam surfaced diaphragm. 4,163,876, Cl. 179-115.50R.

Oil-Dri Corporation of America: *See*—
Been, Karl, 4,163,674, Cl. 106-15.050.

Okumura, Akio: *See*—
Shiba, Keisuke; Hirose, Takeshi; Arai, Atsuaki; Okumura, Akio; and Yokota, Yukio, 4,163,670, Cl. 96-74.000.

Olander, Emil E., Jr.; James, Rex L.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., to Hewlett-Packard Company. Programmable calculator including alphanumeric display means. 4,164,019, Cl. 364-710.000.

Olander, Emil E., Jr.; James, Rex L.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., to Hewlett-Packard Company. Programmable calculator including a key for performing either a subtraction or a unary minus function. 4,164,039, Cl. 364-709.000.

Olin Corporation: *See*—
Kuo, Han C.; Geren, George W.; Corvin, Thomas E.; and Ahn, Byung K., 4,163,698, Cl. 204-1.00T.

Olshansky, Robert, to Corning Glass Works. Multimode waveguide with enhanced coupling with guided modes. 4,163,601, Cl. 350-96.310.

Olympus Optical Company Ltd.: *See*—
Kobayashi, Minoru, 4,163,916, Cl. 310-246.000.

Omae, Tsutomu; and Sakai, Keiziro, to Hitachi, Ltd. Control apparatus for an automatic pipe welder. 4,163,886, Cl. 219-60.00A.

O'Neill, Donald C. Highway safety device. 4,163,426, Cl. 116-28.00R.

O'Neill, Michael J.: *See*—
Schnittjer, Bradley J.; and O'Neill, Michael J., 4,163,627, Cl. 414-686.000.

Ono, Kazuyoshi: *See*—
Takeuchi, Tatuo; Ono, Kazuyoshi; Furukawa, Naotake; Sugiura, Katsuaki; Suzuki, Osamu; and Shimizu, Takeshi, 4,163,358, Cl. 57-78.000.
Origin Electric Co., Ltd.: *See*—
Komatsu, Akio; and Inaba, Masaharu, 4,163,891, Cl. 219-121.00P.
Orr, Thomas. Heartbeat rate monitor. 4,163,447, Cl. 128-666.000.
Osaki, Naoto: *See*—
Ikarashi, Takeo; Goto, Mikio; Sano, Kozo; Osaki, Naoto; Aoyama, Tetsuo; and Horie, Shigeru, 4,163,863, Cl. 568-798.000.
Ostermiller, Joseph. Cattle guard. 4,163,545, Cl. 256-17.000.
Oswald, Alexis A., to Exxon Research & Engineering Co. Polythioethers formed by anionic ring opening of episulfides. 4,163,832, Cl. 528-76.000.
Ouaknine, Gilbert. Dental occluder. 4,163,319, Cl. 32-32.000.
Oude Alink, Bernardus A.; and Thompson, Neil E. S., to Petrolite Corporation. Fuel oils containing N,N-substituted diamines. 4,163,646, Cl. 44-73.000.
Outlaw, Benjamin T.: *See*—
Redmore, Derek; and Outlaw, Benjamin T., 4,163,771, Cl. 422-16.000.
Owen, Charles. Air-to-air heat pump. 4,163,369, Cl. 62-2.000.
Owens-Corning Fiberglas Corporation: *See*—
Finn, Lawrence R.; McCartan, Daniel A.; and Schmandt, Gary M., 4,163,353, Cl. 53-430.000.
Symborski, Alex P.; Fulmer, Ray M.; and Thomas, David W., 4,163,653, Cl. 65-2.000.
Owens-Illinois, Inc.: *See*—
Elser, William F., 4,163,504, Cl. 220-66.000.
Oxy Metal Industries Corporation: *See*—
Nagae, Yoshio; and Utsumi, Takashi, 4,163,679, Cl. 148-6.270.
P. Ferrero & C. S.p.A.: *See*—
Dogliotti, Amilcare, 4,163,496, Cl. 206-538.000.
Pako Corporation: *See*—
Diesch, Robert E.; and Strunc, Gerald R., 4,163,405, Cl. 83-371.000.
Papendick, Klaus; and Peter, Lothar, to Metallgesellschaft Aktiengesellschaft. Device for tensioning corona-discharge electrode elements. 4,163,307, Cl. 29-25.190.
Paper Converting Machine Company: *See*—
Nystrand, Ernst D., 4,163,548, Cl. 270-39.000.
Papp, Gyula: *See*—
Harsanyi, Kalman; Takacs, Kalman; Kiss, Pal; Szekeres, Laszlo; Papp, Gyula; and Benedek, Eva, 4,163,786, Cl. 421-258.000.
Papsdorf, John W.: *See*—
MacDonald, Robert D.; Rose, Robert K.; and Papsdorf, John W., 4,163,474, Cl. 165-179.000.
Parcor: *See*—
Ferrand, Gerard; and Maffrand, Jean-Pierre, 4,163,852, Cl. 546-114.000.
Pardes, Herman I.: *See*—
Sherburne, Frederick B.; Pardes, Herman I.; and Hughes, Edward S., 4,163,328, Cl. 35-25.000.
Partes, Gunther, to Intertech Zeichengerate Gunther Partes KG. Compass with fine adjustment. 4,163,322, Cl. 33-27.00B.
Patel, Harish A.: *See*—
McAvinn, James D.; and Patel, Harish A., 4,163,896, Cl. 219-525.000.
Patnaude, Edmond J. Speed compensating control system. 4,164,001, Cl. 361-236.000.
Patterson, David D. Toilet facility. 4,163,294, Cl. 4-111.000.
Patterson, John A.; Crawford, Wheeler C.; and Wilson, James R., to Texaco Inc. Styrene process. 4,163,761, Cl. 585-431.000.
Patterson, Marvin L.; Haselby, Robert D.; and Kendig, Albert P., to Hewlett-Packard Company. Open-loop electric drive with corrective controller. 4,163,928, Cl. 318-573.000.
Patterson, Richard A., to Minnesota Mining and Manufacturing Company. Closure assembly having a tear template. 4,163,506, Cl. 220-260.000.
Pearson, Durk J.; and Bohn, Jack R., to TRW Inc. Pressure swing recovery system for mineral deposits. 4,163,580, Cl. 299-5.000.
Pearson, Kenneth R., to Alumax Mill Products, Inc. Aluminum alloy containing manganese and copper and products made therefrom. 4,163,665, Cl. 75-143.000.
PEC Process Engineering Company SA: *See*—
Mueller, Hans, 4,163,720, Cl. 210-197.000.
Pera, John D.: *See*—
Buckman, John D.; Mercer, Gerald D.; and Pera, John D., 4,163,733, Cl. 252-180.000.
Percival, Albert; and Judson, Philip N., to Fisons Limited. Substituted pyrazolopyrimidine compounds. 4,163,846, Cl. 544-262.000.
Peter, Lothar: *See*—
Papendick, Klaus; and Peter, Lothar, 4,163,307, Cl. 29-25.190.
Peterson, Stanley O., to Preway, Inc. Latch mechanism for an oven door. 4,163,443, Cl. 126-197.000.
Petrolite Corporation: *See*—
Cheng, William J.; and Guthrie, David B., 4,163,645, Cl. 44-62.000.
Cheng, William J.; and Guthrie, David B., 4,163,728, Cl. 252-18.000.
Oude Alink, Bernardus A.; and Thompson, Neil E. S., 4,163,646, Cl. 44-73.000.
Redmore, Derek; and Outlaw, Benjamin T., 4,163,771, Cl. 422-16.000.
Redmore, Derek, 4,163,850, Cl. 546-21.000.
Pfizer Inc.: *See*—
Holland, Gerald F., 4,163,784, Cl. 424-246.000.
Kuhla, Donald E., 4,163,745, Cl. 546-84.000.
Pfleiderer, Hans-Joerg: *See*—
Knauer, Karl; Schlichte, Max; and Pfleiderer, Hans-Joerg, 4,163,957, Cl. 333-165.000.
Phelps, Robert J., to Telephonic Equipment Corporation. Telephone solid state ringer. 4,163,873, Cl. 179-84.00T.
Philadelphia Gear Corporation: *See*—
Connolly, John R.; Gibson, David E.; Heimark, Edward L.; Quinn, Jerome B.; Speechley, Richard E.; and Winter, Richard L., 4,163,631, Cl. 416-185.000.
Philagro: *See*—
Thizy, Andre; and Debourge, Jean-Claude, 4,163,782, Cl. 424-217.000.
Philip Morris Incorporated: *See*—
Edwards, William B., III; Secor, Henry V.; and Cromwell, Norman H., 4,163,856, Cl. 546-329.000.
Secor, Henry V.; and Edwards, William B., III, 4,163,855, Cl. 546-329.000.
Phillips Petroleum Company: *See*—
Archerd, Paul H., 4,163,695, Cl. 203-18.000.
Moczygemba, George A., 4,163,765, Cl. 525-314.000.
Nash, Larry L., 4,163,764, Cl. 525-2.000.
Rush, Elton E., 4,163,837, Cl. 528-498.000.
Phillips, William D.: *See*—
Randell, Donald R.; Hyde, Thomas G.; Lamb, Frank; Clubley, Brian G.; and Phillips, William D., 4,163,731, Cl. 252-78.500.
Piesch, Steffen, to Cassella Aktiengesellschaft. Preparation of electrolyte-free aminoplast resins. 4,163,835, Cl. 528-254.000.
Pilot Ink Co., Ltd.: *See*—
Hirano, Katsumi; Teranishi, Takeshi; Kosaki, Kunio; and Honda, Kazuhiko, 4,163,675, Cl. 106-22.000.
Pine State Creamery Company: *See*—
Redfern, Robert B.; and Rizk, Samir F., 4,163,802, Cl. 426-43.000.
Pivawer, Philip M., to Diaz Chemical Corporation. Process for the simultaneous preparation of aromatic acid chlorides and aliphatic acid chlorides. 4,163,753, Cl. 260-544.00D.
Plugge, Jay S.; and Hammer, Eugene S., to General Electric Company. Detachable high voltage connection. 4,163,599, Cl. 339-115.00C.
Pociask, Joseph R.: *See*—
Blackwell, Joseph T., III; Gupton, John T.; Miyazaki, Teruko U.; Nabors, James B.; and Pociask, Joseph R., 4,163,848, Cl. 544-319.000.
Polaroid Corporation: *See*—
Eckert, Robert D.; Levy, Boris; and Mahoney, John B., 4,163,816, Cl. 427-401.000.
Polstorff, Jurgen K. Double loop receiver-transmitter combination. 4,163,977, Cl. 343-112.00R.
Pope, Bill J.; Horton, M. Duane; and Hall, H. Tracy, to Brigham Young University. High thermal conductivity substrate. 4,163,769, Cl. 264-42.000.
Porosoff, Harold, to American Cyanamid Company. Melt-spinning acrylonitrile polymer fibers. 4,163,770, Cl. 264-210.300.
Porter, Ralph D., to Towmotor Corporation. Fluid cylinder control with precision stop action. 4,163,412, Cl. 91-451.000.
Powers, Harold C., to Caterpillar Tractor Co. Fuel pump plunger. 4,163,634, Cl. 417-499.000.
Prem, Dorothy C.: *See*—
Duke, June T.; and Prem, Dorothy C., 4,163,766, Cl. 525-230.000.
Preway, Inc.: *See*—
Peterson, Stanley O., 4,163,443, Cl. 126-197.000.
Price, John J., to Motorola, Inc. Bias circuit for complementary transistors. 4,163,908, Cl. 307-296.00R.
Priestley, Timothy M.: *See*—
Bird, Alfred J.; Priestley, Timothy M.; and Winterbottom, John M., 4,163,750, Cl. 260-409.000.
Prior, Michael D.: *See*—
Morris, John C.; Weidman, James K.; and Prior, Michael D., 4,163,546, Cl. 266-281.000.
Proakis, Anthony G.: *See*—
Franko, Bernard V.; and Proakis, Anthony G., 4,163,790, Cl. 424-267.000.
Procter & Gamble Company, The: *See*—
Amneus, John S., 4,163,509, Cl. 222-95.000.
Wickett, Richard R.; and Kock, William R., 4,163,800, Cl. 424-326.000.
Profera, Charles E., to RCA Corporation. Antenna feed system. 4,163,974, Cl. 343-16.00M.
PROTEC Processi e Tecnologie S.p.A.: *See*—
Ugo, Renato, 4,163,664, Cl. 75-108.000.
Pucel, Robert A., to Raytheon Company. Field effect transistor. 4,163,984, Cl. 357-22.000.
Pullman Inc.: *See*—
Lindauer, Thomas, 4,163,424, Cl. 105-313.000.
Pusa, Onni, to Svenskt Stal Aktiebolag. Refining process based on top-blowing with oxygen. 4,163,663, Cl. 75-60.000.
Quinn, Jerome B.: *See*—
Connolly, John R.; Gibson, David E.; Heimark, Edward L.; Quinn, Jerome B.; Speechley, Richard E.; and Winter, Richard L., 4,163,631, Cl. 416-185.000.
Quint, Hugh D. Electric toothbrush. 4,163,300, Cl. 15-23.000.
Raber, Monte B.: *See*—
Kirk, Bryan W.; Raber, Monte B.; Hatch, Donald J.; and Cramp, Harvey E., 4,163,450, Cl. 128-145.800.
Racal Instruments Limited: *See*—
Brewerton, David, 4,163,940, Cl. 324-132.000.

Race Research, Inc.: *See—*
Wilkinson, Richard L., 4,163,431, Cl. 123-118.000.

Radiometer A/S: *See—*
Sorensen, Soren K.; and Holbek, Carl C., 4,163,734, Cl. 252-408.000.

Rainer Isolierrohrfabrik Max Drossbach: *See—*
Fales, David E., 4,163,619, Cl. 405-49.000.

Rainmatic International, Ltd.: *See—*
Hegemann, Kenneth J., 4,163,459, Cl. 137-344.000.

Ramunas, Valdas S., to Acme-Cleveland Corporation. Adjustable stock feed. 4,163,514, Cl. 226-141.000.

Randell, Brian; Kerr, Ronald; Melliar-Smith, Peter M.; Lauer, Hugh C.; and Horning, James J., to National Research Development Corporation. Computer systems. 4,164,017, Cl. 364-200.000.

Randell, Donald R.; Hyde, Thomas G.; Lamb, Frank; Clubley, Brian G.; and Phillips, William D., to Ciba-Geigy AG. Fire resistant functional fluid compositions based on phosphate esters and substituted aromatic compounds. 4,163,731, Cl. 252-78.500.

Rattlingourd, Glen D.; and Zscheile, John W., Jr., to Sperry Rand Corporation. Electronic digital arctangent computational apparatus. 4,164,022, Cl. 364-729.000.

Rauhala, Kenneth R.: *See—*
Fogg, Lewis W.; Rauhala, Kenneth R.; Satterfield, H. Eugene; and Scott, Eion G., 4,163,342, Cl. 47-58.000.

Ravizza, Raymond F., to Ampex Corporation. Continuous slow motion automatic tracking system. 4,163,993, Cl. 360-10.000.

Raynaud, Roland: *See—*
Delattre, Jacques; Raynaud, Roland; and Thomas, Claude, 4,163,860, Cl. 560-96.000.

Raytheon Company: *See—*
Myers, Herman L., 4,163,921, Cl. 315-39.510.
Pucel, Robert A., 4,163,984, Cl. 357-22.000.

RCA Corporation: *See—*
Carlson, David E.; and Wronski, Christopher R., 4,163,677, Cl. 136-89.0TF.
Profera, Charles E., 4,163,974, Cl. 343-16.00M.
Willis, Donald H., 4,163,926, Cl. 315-408.000.
Woodward, Oakley M., 4,163,961, Cl. 333-261.000.

Redfern, Robert B.; and Rizk, Samir F., to Pine State Creamery Company. Preparation of yogurt. 4,163,802, Cl. 426-43.000.

Redmore, Derek; and Outlaw, Benjamin T., to Petrolite Corporation. Hydroxyalkylaminoalkylamides as corrosion inhibitors for metals in an aqueous brine environment. 4,163,771, Cl. 422-16.000.

Redmore, Derek, to Petrolite Corporation. Polycyclic full quaternary nitrogen-heterocyclic phosphonates. 4,163,850, Cl. 546-21.000.

Regal, Robert A. Enuresis treatment device. 4,163,449, Cl. 128-138.00A.

Reichenecker, William J.: *See—*
Almand, John Z., III; Benner, Henry F.; and Reichenecker, William J., 4,163,869, Cl. 174-94.00R.

Reineke, Charles E.: *See—*
Burk, George A.; and Reineke, Charles E., 4,163,797, Cl. 424-304.000.
Burk, George A.; Wilson, Charles A.; and Reineke, Charles E., 4,163,798, Cl. 424-304.000.

Reinhall, Rolf B. Device for evacuating blow-back steam in pulp refining apparatus. 4,163,525, Cl. 241-247.000.

Rella, Hermogenes, to A. Rela s/a Industria e Comercio. Safety package of toothpick holder. 4,163,492, Cl. 206-380.000.

Renal Systems, Inc.: *See—*
Cosentino, Louis C.; Seiler, Louis; and Helms, Richard A., 4,163,722, Cl. 210-236.000.

Renaut, Henry, to Societe Anonyme dite: LEMAIRE. Machine for ironing a shoulder and a sleeve of a garment. 4,163,331, Cl. 38-12.000.

Renfro, Robert. Tennis racket and stringing method. 4,163,553, Cl. 273-73.00D.

Research Corporation: *See—*
Wasserman, Harry H.; and Tremper, Alan W., 4,163,743, Cl. 260-239.00A.

Reudink, Douglas O.: *See—*
Acampora, Anthony; Reudink, Douglas O.; and Yeh, Yu S., 4,163,942, Cl. 325-52.000.

Reuter, James L.: *See—*
Yeh, Keming W.; and Reuter, James L., 4,163,988, Cl. 357-55.000.

Rexnord Inc.: *See—*
Timm, Ulrich, 4,163,490, Cl. 198-531.000.

Rheinische Braunkohlenwerke AG: *See—*
Velling, Gunter; and Ruddeck, Wolfhard, 4,163,464, Cl. 141-198.000.

Rhone-Poulenc-Textile: *See—*
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Richter Gedeon Vegyeszeti Gyar RT: *See—*
Clauder, Otto; Kiraly, Arpad; Kokosi, Jozsef; Karpati, Egon; and Szporny, Laszlo, 4,163,851, Cl. 546-51.000.

Richters, Johannes J.: *See—*
Macierewicz, Jacek J.; Richters, Johannes J.; and St. John, James E., 4,163,719, Cl. 210-84.000.

Rickel, William; and Hauch, Dennis W., to Whirlpool Corporation. Termination fixture for a corrugated drain hose. 4,163,457, Cl. 137-216.000.

Rickert, Milton E., Jr., to General Electric Company. Process for rendering surfaces permanently water wettable and novel product thus-produced. 4,163,702, Cl. 204-181.00T.

Ricks, Michael J.: *See—*
Malhotra, Sudarshan K.; and Ricks, Michael J., 4,163,787, Cl. 424-263.000.

Riedinger, Larry, Jr.; and Spector, George. Cornscrew. 4,163,575, Cl. 294-5.000.

Rieger, Michael L.; and Singer, Martin D., to Tektronix, Inc. Filter for digital-to-analog converter. 4,163,948, Cl. 328-167.000.

Risi, Roberto, to MA.CO S.a.s. di Saso Vittorio & C. Labelling machine for applying a label, in particular a sealing band, to a container. 4,163,686, Cl. 156-492.000.

Rismondo, Michael A.: *See—*
Romano, Giuliano; and Rismondo, Michael A., 4,163,723, Cl. 210-319.000.

Rivkin, Boris S.: *See—*
Lapy, Viktor J.; Chernov, Boris P.; Georgizon, Evgeny B.; Koshevoi, Anatoly A.; Yavorsky, Gerald I.; Glaziev, Valentin I.; Rivkin, Boris S.; Yakushenkov, Andrei A.; and Kurochkin, Sergei F., 4,163,972, Cl. 343-7.00A.

Rivron, Maurice: *See—*
Guilhem, Robert; Rivron, Maurice; and Weulersse, Bruno, 4,163,975, Cl. 343-16.00M.

Rizk, Samir F.: *See—*
Redfern, Robert B.; and Rizk, Samir F., 4,163,802, Cl. 426-43.000.

RJR Archer, Inc.: *See—*
Kartanson, John M., 4,163,684, Cl. 156-259.000.

Robbins, Desmond W.: *See—*
Robbins, Robert J.; and Robbins, Desmond W., 4,163,356, Cl. 56-328.00R.

Robbins, Robert J.; and Robbins, Desmond W. Tree fruit picker. 4,163,356, Cl. 56-328.00R.

Robert Bosch GmbH: *See—*
Hertfelder, Wilhelm, 4,163,432, Cl. 123-102.000.

Robertson, Allan J.: *See—*
Corver, Hans A.; and Robertson, Allan J., 4,163,820, Cl. 428-212.000.

Robertson, Donald, to Leeds & Northrup Company. Flame monitoring apparatus. 4,163,903, Cl. 250-554.000.

Robertson, Jerry E.: *See—*
Harrington, Joseph K.; Kvam, Donald C.; Mendel, Arthur; and Robertson, Jerry E., 4,163,659, Cl. 71-76.000.

Rock, Vincent M.; and Severinsen, Arne R., to Elliott Bay Plywood Machines Co. Wood veneer clipper infeed conveyor retractable holddown mechanism. 4,163,491, Cl. 198-836.000.

Rockwell International Corporation: *See—*
Hayes, Cecil L., 4,163,954, Cl. 332-7.510.

Rodder, Jerome A. Bipolar fluid measuring apparatus. 4,163,390, Cl. 73-204.000.

Rolfite Company, The: *See—*
Bowers, Wayne E., 4,163,644, Cl. 44-51.000.

Romano, Giuliano; and Rismondo, Michael A., to National Petro Chemicals Corporation. Continuously operated liquid-solids separator. 4,163,723, Cl. 210-319.000.

Romano, Ugo: *See—*
Illuminati, Gabriello; and Romano, Ugo, 4,163,861, Cl. 560-132.000.

Roosa, Vernon D., to Stanadyne, Inc. Fuel injector. 4,163,521, Cl. 239-86.000.

Roquette Freres: *See—*
Devos, Francis; Leroy, Patrick; and Huchette, Michel, 4,163,691, Cl. 435-174.000.

Rose, Robert K.: *See—*
MacDonald, Robert D.; Rose, Robert K.; and Papsdorf, John W., 4,163,474, Cl. 165-179.000.

Rosenberg, Aaron E.: *See—*
Dubnowski, John J.; and Rosenberg, Aaron E., 4,164,025, Cl. 364-900.000.

Rosenberger, Paul C.: *See—*
Fisher, William F.; and Rosenberger, Paul C., 4,163,400, Cl. 74-710.000.

Rosenkranz, Hans-Jurgen: *See—*
Wolfers, Heinrich; Rudolph, Hans; and Rosenkranz, Hans-Jurgen, 4,163,865, Cl. 568-640.000.

Rothenstein, Julius; and Goldhagen, Samuel, to United States of America, Navy. Desensitized explosives and castable thermally stable high energy explosive compositions therefrom. 4,163,681, Cl. 149-11.000.

Rowney, John E.: *See—*
Mamers, Heikki; and Rowney, John E., 4,163,687, Cl. 162-21.000.

Rudd, John F., to Dow Chemical Company, The. Blends of phenolphthalein polycarbonates with rubber-modified monovinylidene aromatic copolymers. 4,163,762, Cl. 525-67.000.

Ruddeck, Wolfhard: *See—*
Velling, Gunter; and Ruddeck, Wolfhard, 4,163,464, Cl. 141-198.000.

Rudolph, Hans: *See—*
Wolfers, Heinrich; Rudolph, Hans; and Rosenkranz, Hans-Jurgen, 4,163,865, Cl. 568-640.000.

Rudolph, John E.: *See—*
Meyer, Robert H.; Graham, Charles I.; Rudolph, John E.; and Haas, Robert E., 4,163,804, Cl. 426-315.000.

Rumer, David O., Jr.; Findlay, Donald J.; Neumann, Arthur E.; and del Castillo, Juan M., to del Castillo, Juan M. Optical metronomes. 4,163,409, Cl. 84-484.000.

Rusch, Reinhart: *See—*
Arndt, Friedrich; Kruger, Hans-Rudolf; and Rusch, Reinhart, 4,163,658, Cl. 71-73.000.

Rush, Elton E., to Phillips Petroleum Company. Multiple loci countercurrent washing. 4,163,837, Cl. 528-498.000.

Russell, Anthony W.: *See—*
Russell, Michael K.; and Russell, Anthony W., 4,163,324, Cl. 33-313.000.

Russell, Homer C.: *See—*
Olander, Emil E., Jr.; James, Rex L.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., 4,164,019, Cl. 364-710.000.
Olander, Emil E., Jr.; James, Rex L.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., 4,164,039, Cl. 364-709.000.

Russell, James T., to Jacobs, Eli S. Light beam scanner. 4,163,600, Cl. 350-6.700.

Russell, Michael K.; and Russell, Anthony W. Surveying of boreholes. 4,163,324, Cl. 33-313.000.

Ryckman, William D., Jr., to General Electric Company. Probe control. 4,163,963, Cl. 338-28.000.

S. C. Johnson & Son, Inc.: *See—*
Dechert, Roberta S., 4,163,673, Cl. 106-11.000.

Saari, Walfred S.: *See—*
Lumma, William C., Jr.; Saari, Walfred S.; and Zacchei, Anthony G., 4,163,849, Cl. 544-357.000.

Safe-T-Lawn, Inc.: *See—*
Hardy, Charles T., 4,163,522, Cl. 239-230.000.

Sagami Chemical Research Center: *See—*
Kondo, Kiyosi; Tunemoto, Daiei; and Umemoto, Teruo, 4,163,758, Cl. 260-586.00R.

Sagara, Seiji: *See—*
Ito, Yoshio; Tohyama, Yoshikuni; and Sagara, Seiji, 4,163,549, Cl. 271-174.000.

Sai, Fumio; and Murata, Moriyasu, to Kao Soap Co., Ltd. Detergent composition containing water-insoluble phosphorus-containing aluminosilicate builders. 4,163,732, Cl. 252-99.000.

Saidla, Glen E. W., to Exxon Research & Engineering Co. Fiber foam and process. 4,163,824, Cl. 428-313.000.

St. John, James E.: *See—*
Macierewicz, Jacek J.; Richters, Johannes J.; and St. John, James E., 4,163,719, Cl. 210-84.000.

Saito, Satoshi, to Japan Storage Battery Company Limited. Electrochemical potential memory device using liquid electrolyte. 4,164,004, Cl. 361-433.000.

Saitou, Tadashi: *See—*
Sakamaki, Hiroshi; Maeda, Toshiyuki; Sakai, Toshimitsu; and Saitou, Tadashi, 4,163,635, Cl. 418-236.000.

Sakai, Keiziro: *See—*
Omae, Tsutomu; and Sakai, Keiziro, 4,163,886, Cl. 219-60.00A.

Sakai, Masao, to Hitachi, Ltd. Magnetrons. 4,163,922, Cl. 315-39.710.

Sakai, Toshimitsu: *See—*
Sakamaki, Hiroshi; Maeda, Toshiyuki; Sakai, Toshimitsu; and Saitou, Tadashi, 4,163,635, Cl. 418-236.000.

Sakai, Yoshiaki, to Teac Corporation. Tape speed control servomechanism for a magnetic tape cassette apparatus. 4,163,532, Cl. 242-186.000.

Sakamaki, Hiroshi; Maeda, Toshiyuki; Sakai, Toshimitsu; and Saitou, Tadashi, to Nippon Piston Ring Kabushiki Kaisha; and Toyota Jidosha Kogyo Kabushiki Kaisha. Vane type rotary fluid pumps or compressors. 4,163,635, Cl. 418-236.000.

Sakamoto, Hitoshi; and Wakisaka, Yoshiaki, to Sony Corporation. Automatic head tracking system utilizing transducer deflecting means and synchronous demodulation of the envelope signal. 4,163,994, Cl. 360-70.000.

Sakurada, Nobuaki; Mashimo, Yukio; Ito, Tadashi; Ito, Fumio; and Shinoda, Nobuhiko, to Canon Kabushiki Kaisha. Apparatus for checking a battery voltage. 4,163,935, Cl. 324-29.500.

Salam, Hassan P. A. Matrix display device. 4,163,332, Cl. 40-449.000.

Salkind, Morton: *See—*
Cooperman, Isadore; and Salkind, Morton, 4,163,427, Cl. 116-217.000.

Samuels, David W.: *See—*
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Sanders, David E.: *See—*
Chambers, Ramon P.; Gordy, Robert S.; Sanders, David E.; and Morrison, Cameron E., 4,163,944, Cl. 325-446.000.

Sanders, James M.; Vinals, Joaquin F.; and Schmitt, Frederick L., to International Flavors & Fragrances Inc. Substituted bicyclooctenemethanols, process for producing same and uses of same for augmenting or enhancing the organoleptic properties of tobaccos, perfumes and perfumed articles. 4,163,737, Cl. 252-522.000.

Sanders, S. David: *See—*
Nieman, John R.; and Sanders, S. David, 4,163,827, Cl. 428-377.000.

Sanderson, William R., to Singer Company, The. Rear/remote-screen projector. 4,163,610, Cl. 353-71.000.

Sanford, Lawrence. Inflatable packer. 4,163,562, Cl. 277-34.300.

Sano, Kozo: *See—*
Ikarashi, Takeo; Goto, Mikio; Sano, Kozo; Osaki, Naoto; Aoyama, Tetsuo; and Horie, Shigeru, 4,163,863, Cl. 568-798.000.

Sano, Takezo; Shimomura, Takatoshi; Sasaki, Masao; Murase, Ichiki; and Hirakawa, Manabu, to Sumitomo Chemical Company, Limited. Process for preparing of semipermeable membranes. 4,163,725, Cl. 210-490.000.

Sargent & Greenleaf, Inc.: *See—*
Miller, Benson L.; and Helesfai, Steven, 4,163,376, Cl. 70-303.00A.

Sarphie, Theodore E.: *See—*
Glennon, Timothy F.; Sarphie, Theodore E.; and Faulkner, Dennis T., 4,164,033, Cl. 364-431.000.
Glennon, Timothy F.; Sarphie, Theodore E.; and Faulkner, Dennis T., 4,164,034, Cl. 364-431.000.
Glennon, Timothy F.; and Sarphie, Theodore E., 4,164,035, Cl. 364-431.000.

Sasaki, Makoto: *See—*
Tsuchiya, Shozo; Hayashi, Hideo; Sasaki, Makoto; Goto, Kiyoshi; and Matsubara, Toru, 4,163,763, Cl. 525-290.000.

Sasaki, Masao: *See—*
Sano, Takezo; Shimomura, Takatoshi; Sasaki, Masao; Murase, Ichiki; and Hirakawa, Manabu, 4,163,725, Cl. 210-490.000.

Saterbak, Robert T.: *See—*
Blind, Roger A.; Saterbak, Robert T.; and Wolfe, Edward I., 4,163,717, Cl. 210-31.00R.

Sato, Koichi: *See—*
Jikihara, Kazuo; Itoh, Shigekazu; Takayama, Shuichi; Sato, Koichi; Kimura, Ichiro; and Chiyomaru, Isao, 4,163,661, Cl. 71-108.000.

Satterfield, H. Eugene: *See—*
Fogg, Lewis W.; Rauhala, Kenneth R.; Satterfield, H. Eugene; and Scott, Eion G., 4,163,342, Cl. 47-58.000.

Sauer, Hans, to Matsushita Electric Works, Ltd.; and Sauer, Hans, part interest to each. Method of manufacturing an electromagnetic relay. 4,163,314, Cl. 29-593.000.

Schack, Carl J.; and Christe, Karl O., to United States of America, Navy. $N_2F_3SbF_6$ and its preparation. 4,163,774, Cl. 423-351.000.

Schack, Carl J.: *See—*
Christe, Karl O.; and Schack, Carl J., 4,163,773, Cl. 423-351.000.

Schako Metallwarenfabrik Ferdinand Schad GmbH: *See—*
Kurrle, Hermann; and Muller, Gottfried, 4,163,416, Cl. 98-40.00R.

Schattmaier, Kurt: *See—*
Heller, Rudolf; and Schattmaier, Kurt, 4,163,536, Cl. 248-118.000.

Schepacz, Charles, to Centre Technique des Industries Mecaniques. Method of electrochemical machining of polyphase alloys. 4,163,701, Cl. 204-129.750.

Scherer, George P.: *See—*
Iden, Floyd W.; and Scherer, George P., 4,163,955, Cl. 333-127.000.

Scherer, Richard M., to Chambers Corporation. Oven hinge mechanism including cam balance modifier. 4,163,344, Cl. 49-386.000.

Scherer, Richard M., to Chambers Corporation. Oven having a diluting ventilation system. 4,163,894, Cl. 219-391.000.

Schering Aktiengesellschaft: *See—*
Arndt, Friedrich; Kruger, Hans-Rudolf; and Rusch, Reinhart, 4,163,658, Cl. 71-73.000.

Schiff, Vicki L.: *See—*
Norwalt, Robert H.; Hibbert, Edward R.; and Schiff, Vicki L., 4,163,555, Cl. 273-86.00B.

Schlichte, Max: *See—*
Knauer, Karl; Schlichte, Max; and Pfleiderer, Hans-Joerg, 4,163,957, Cl. 333-165.000.

Schmandt, Gary M.: *See—*
Finn, Lawrence R.; McCartan, Daniel A.; and Schmandt, Gary M., 4,163,353, Cl. 53-430.000.

Schmid, Charles F.: *See—*
Krenzer, Orville; Midden, William E.; and Schmid, Charles F., 4,163,529, Cl. 242-85.100.

Schmidt, Gunter, to Du Pont de Nemours, E. I., and Company. Cassette unloader. 4,163,499, Cl. 414-411.000.

Schmitt, Frederick L.: *See—*
Sanders, James M.; Vinals, Joaquin F.; and Schmitt, Frederick L., 4,163,737, Cl. 252-522.000.

Schnittjer, Bradley J.; and O'Neill, Michael J., to Deere & Company. Mounting for an implement on a tractor. 4,163,627, Cl. 414-686.000.

Schoch, Robert, to Weinmann GmbH & Co. KG. Rim brake for a bicycle. 4,163,481, Cl. 188-24.000.

Schoenfield, Connie. Educational toy and amusement device. 4,163,343, Cl. 47-66.000.

Schoenmakers, Theodorus M. B., to U.S. Philips Corporation. Device for the simultaneous operation of a number of gas discharge electron guns. 4,163,889, Cl. 219-121.0EB.

Schonstedt, Erick O., to Schonstedt Instrument Company. Housing for circuitry and loudspeaker of a magnetic locator shields and resiliently mounts the loudspeaker. 4,163,877, Cl. 179-146.00E.

Schonstedt Instrument Company: *See—*
Schonstedt, Erick O., 4,163,877, Cl. 179-146.00E.

Schroeder, Bernd; Braden, Rudolf; Auge, Wolfgang; Thiem, Karl-Werner; and Neeff, Rutger, to Bayer Aktiengesellschaft. Process for the preparation of 1-alkylamino-anthraquinones. 4,163,747, Cl. 260-378.000.

Schroeder, James E.; and Goslin, Richard L., to Harris Corporation. Three logic state input buffers. 4,163,907, Cl. 307-209.000.

Schroeder, Rondon L. Aircraft cabin display unit. 4,163,387, Cl. 73-178.00R.

Schuchard, Walter F., to ESB Incorporated. Current sensing system. 4,164,016, Cl. 363-88.000.

Schuermeyer, Fritz L.; and Young, Charles R., to United States of America, Air Force. Nonvolatile punch through memory cell with buried n+ region in channel. 4,163,985, Cl. 357-23.000.

Schuierer, Manfred, to Bruckner Apparatebau GmbH. Dyeing of pile fabrics. 4,163,298, Cl. 8-151.000.

Schutz, Johann. Pool cover. 4,163,295, Cl. 4-172.140.

Schutz, Klaus; Helber, Holger; and Lange, Gerhard, to U.S. Philips Corporation. Infrared pick-up device comprising an infrared sensitive television pick-up tube. 4,163,602, Cl. 358-113.000.

Schwartz, Barbara: *See*—
Miller, Garry E.; and Dalke, Michael, 4,164,008, Cl. 362-103.000.
SCM Corporation: *See*—
McGinniss, Vincent D.; Ting, Vincent W.; and Kah, Ann F., 4,163,809, Cl. 427-44.000.
McGinniss, Vincent D., 4,163,810, Cl. 427-54.000.
Mueller, Richard A., 4,163,805, Cl. 426-575.000.
Scott, Eion G.: *See*—
Fogg, Lewis W.; Rauhala, Kenneth R.; Satterfield, H. Eugene; and Scott, Eion G., 4,163,342, Cl. 47-58.000.
Sealol, Inc.: *See*—
Mullaney, John J., 4,163,563, Cl. 277-88.000.
Secor, Henry V.; and Edwards, William B., III, to Philip Morris Incorporated. Azetidine compounds and process for production. 4,163,855, Cl. 546-329.000.
Secor, Henry V.: *See*—
Edwards, William B., III; Secor, Henry V.; and Cromwell, Norman H., 4,163,856, Cl. 546-329.000.
Seeger, Hans-Jochen, to Vereinigte Flugtechnische Werke-Fokker GmbH. Steering of an aerodynamic vehicle. 4,163,534, Cl. 244-3.220.
Sega Corporation: *See*—
Norwalt, Robert H.; Hibbert, Edward R.; and Schiff, Vicki L., 4,163,555, Cl. 273-86.00B.
Seiko Seiki Kabushiki Kaisha: *See*—
Matsuno, Takeshi; Nishiyama, Fumiya; and Kobayashi, Takeshi, 4,163,313, Cl. 29-563.000.
Seiler, Louis: *See*—
Cosentino, Louis C.; Seiler, Louis; and Helms, Richard A., 4,163,722, Cl. 210-236.000.
Seitz, David R.; and Heaton, Mark T., to Globe Tool and Engineering Company, The. Armature winding machine. 4,163,931, Cl. 318-569.000.
Sellers, Gregory J.: *See*—
Nienart, Louis F.; Sellers, Gregory J.; Bretts, Gerald R.; and Timan, Dirk A., 4,163,821, Cl. 428-245.000.
Semenov, Vasily K.: *See*—
Kupriyanov, Mikhail J.; Lapir, Gennady M.; Likharev, Konstantin K.; Semenov, Vasily K.; and Kandyba, Petr E., 4,164,030, Cl. 365-162.000.
Semjonow, Valentin; and Foedrowitz, Jurgen, to Hoechst Aktiengesellschaft. Process and device for the manufacture of non woven webs from filaments. 4,163,305, Cl. 19-299.000.
Sercombe, Geoffrey, to G. S. Compactors Limited. Compactor arrangement. 4,163,420, Cl. 100-223.000.
Sergeev, Stanislav S.: *See*—
Minasov, Alexandr N.; Likhogub, Evgeny P.; and Sergeev, Stanislav S., 4,163,694, Cl. 202-139.000.
Severinsen, Arne R.: *See*—
Rock, Vincent M.; and Severinsen, Arne R., 4,163,491, Cl. 198-836.000.
Sguera, Oronzo: *See*—
Gazzi, Luigi; and Sguera, Oronzo, 4,163,652, Cl. 62-28.000.
Shadrin, Nikolai I.: *See*—
Zhukovsky, Sergie S.; Shadrin, Nikolai I.; Teplyakov, Sergei D.; Lyass, Abram M., deceased; and Lyass, Inna E., administrator, 4,163,741, Cl. 260-33.40R.
Shaltiel, David; Davidov, Dan; and Jacob, Isaac. Hydrogen charged alloys of $Zr(A_{1-x}B_x)_2$ and method of hydrogen storage. 4,163,666, Cl. 75-177.000.
Shanley, John J.: *See*—
Crowe, John E.; and Shanley, John J., 4,164,014, Cl. 363-49.000.
Sharp Rifle Co., Ltd.: *See*—
Chiba, Kensuke, 4,163,439, Cl. 124-70.000.
Sheets, James R.: *See*—
Sheets, Nancy S.; and Sheets, James R., 4,163,813, Cl. 427-198.000.
Sheets, Nancy S.; and Sheets, James R. Method of preparing and applying artistic, decorative compositions. 4,163,813, Cl. 427-198.000.
Sheldon, Loren B.; and Kelly, Robert R., to B. J. Hughes Inc. Electrohydraulic interface for a power tongs. 4,163,401, Cl. 81-57.340.
Shell Oil Company: *See*—
Clark, Michael T.; and Ten Haken, Pieter, 4,163,793, Cl. 424-275.000.
Goudriaan, Frans; and van Klinken, Jakob, 4,163,707, Cl. 208-44.000.
Shelton, Joe. Electron beam forming device. 4,163,918, Cl. 313-309.000.
Shelton, Joe. Tubistor. 4,163,949, Cl. 328-254.000.
Shepherd, Eric G.; and Spragg, Roger D., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Radio direction finding. 4,163,978, Cl. 343-120.000.
Sherburne, Frederick B.; Pardes, Herman I.; and Hughes, Edward S., to United States of America, Army. Moving target screen with improved optical control. 4,163,328, Cl. 35-25.000.
Sherwood, Edward F., to Westinghouse Electric Corp. Decorative drop ceiling. 4,164,011, Cl. 362-148.000.
Shiba, Keisuke; Hirose, Takeshi; Arai, Atsuaki; Okumura, Akio; and Yokota, Yukio, to Fuji Photo Film Co., Ltd. Color photographic material. 4,163,670, Cl. 96-74.000.
Shigeta, Tatsuo, to Kabushiki Kaisha Think Laboratory. Processing equipment for use in the processing of a photoengraving cylinder. 4,163,454, Cl. 134-57.00R.
Shimamura, Hironori, to Nippon Electronics Memory Industry Co., Ltd. Time division switching regulator. 4,163,906, Cl. 307-39.000.
Shimazaki, Masami: *See*—
Umezawa, Hamao; Takeuchi, Tomio; Kondo, Shinichi; and Shimazaki, Masami, 4,163,839, Cl. 536-24.000.
Shimizu, Takeshi: *See*—
Takeuchi, Tatuo; Ono, Kazuyoshi; Furukawa, Naotake; Sugiura, Katsuaki; Suzuki, Osamu; and Shimizu, Takeshi, 4,163,358, Cl. 57-78.000.
Shimomura, Takatoshi: *See*—
Sano, Takezo; Shimomura, Takatoshi; Sasaki, Masao; Murase, Ichiki; and Hirakawa, Manabu, 4,163,725, Cl. 210-490.000.
Shinoda, Nobuhiko: *See*—
Sakurada, Nobuaki; Mashimo, Yukio; Ito, Tadashi; Ito, Fumio; and Shinoda, Nobuhiko, 4,163,935, Cl. 324-29.500.
Shirato, Takeshi; and Teshima, Kiyomi, to Mitsui Engineering & Shipbuilding Co., Ltd. Method for recovering energy possessed by exhaust gas from blast furnace. 4,163,364, Cl. 60-39.020.
Short, James E., Jr.: *See*—
Montgomery, Francis E.; Short, James E., Jr.; and Weaver, William J., 4,163,682, Cl. 149-108.400.
Shufro, Richard B. Audible tester for alarm circuits. 4,163,936, Cl. 324-51.000.
Shuler, James R.: *See*—
Fox, Lawrence E.; and Shuler, James R., 4,163,589, Cl. 305-14.000.
Siemens Aktiengesellschaft: *See*—
Goettler, Ernst; and Grueter, Otto, 4,164,040, Cl. 365-183.000.
Gunne, Ingemar; and Almgren, Bertil, 4,163,500, Cl. 215-260.000.
Kaufhold, Wolfgang, 4,164,013, Cl. 363-45.000.
Knauer, Karl; Schlichte, Max; and Pfleiderer, Hans-Joerg, 4,163,957, Cl. 333-165.000.
Kreil, Siegmund; Zech, Achim; and Hergert, Reinhard, 4,163,870, Cl. 178-26.00R.
Soldner, Richard E., 4,163,394, Cl. 73-626.000.
Turini, Gerhard, 4,163,893, Cl. 219-216.000.
Sigma Instruments Inc.: *See*—
Morin, John O.; and Mini, Joseph R., 4,163,971, Cl. 340-754.000.
Sigmund, Jerry A., to SPS Technologies, Inc. Tightening system. 4,163,310, Cl. 29-407.000.
Sigmund, Jerry A., to SPS Technologies, Inc. Tightening system for blind fasteners. 4,163,311, Cl. 29-407.000.
Signet Optical Corporation: *See*—
Campbell, Charles D., 4,163,541, Cl. 249-117.000.
Campbell, Charles D., 4,163,655, Cl. 65-17.000.
Sih, John C.: *See*—
Johnson, Roy A.; and Sih, John C., 4,163,842, Cl. 542-426.000.
Sihota, Charan J. S. Marker for round or flat objects. 4,163,421, Cl. 101-41.000.
Silverman, Bernard: *See*—
Yung, Kai-Lim W.; and Silverman, Bernard, 4,163,819, Cl. 428-198.000.
Simes, James G.; and Gillott, Donald H., to Sutter Hospitals Medical Research Foundation. Permanent magnet translational motor for respirators. 4,163,911, Cl. 310-27.000.
Simmons, Gerald P.: *See*—
Grooss, Frank A.; and Simmons, Gerald P., 4,163,498, Cl. 414-697.000.
Simon, Pierre, to Union Chimique Continentale U.C.C. Psychostimulant compounds. 4,163,799, Cl. 424-317.000.
Simpson, Bruce A. Vaulting practice box. 4,163,551, Cl. 272-104.000.
Simpson, Melvyn I.: *See*—
Kallianos, Andrew G.; and Simpson, Melvyn I., 4,163,453, Cl. 131-17.00R.
Sims, Anson: *See*—
Jones, Lawrence T.; Sims, Anson; Howden, Ashley G.; and Geery, Michael J., 4,163,341, Cl. 46-262.000.
Singer Company, The: *See*—
Current, Wayne A., 4,163,493, Cl. 206-380.000.
Eaton, Bradley C.; and Taylor, Thomas M., 4,163,999, Cl. 361-23.000.
Sanderson, William R., 4,163,610, Cl. 353-71.000.
Waugh, John B. S., 4,163,396, Cl. 73-721.000.
Singer, Martin D.: *See*—
Rieger, Michael L.; and Singer, Martin D., 4,163,948, Cl. 328-167.000.
Singh, Shobha: *See*—
Di Domenico, Mauro, Jr.; Singh, Shobha; and Van Uitert, Legrand G., 4,163,982, Cl. 357-2.000.
Sireix, Georges. Device for applying adhesive to a plurality of strips. 4,163,429, Cl. 118-117.000.
SK&F Lab Co.: *See*—
Labaw, Clifford S.; Webb, Robert L.; and Wellman, George R., 4,163,858, Cl. 548-342.000.
Skendrovic, Lawrence. Understream turbine plant. 4,163,904, Cl. 290-54.000.
Smart, David C., to Eastman Kodak Company. Camera focus or exposure adjustment mechanism. 4,163,613, Cl. 354-198.000.
Smith, Glenn W. Insulated building panels. 4,163,349, Cl. 52-241.000.
Smith, Kenneth C., to BOC Limited. Treatment of liquid. 4,163,712, Cl. 210-7.000.
Smith & Nephew Research Limited: *See*—
Walter, Brian W., 4,163,822, Cl. 428-304.000.
Smith, Teddy V. Material distribution apparatus for continuous flow material source. 4,163,638, Cl. 425-131.100.
Smorzaniuk, Adam: *See*—
Mayer, Robert W.; and Smorzaniuk, Adam, 4,163,879, Cl. 200-11.0TW.

Snamprogetti S.p.A.: *See—*
Gazzi, Luigi; and Sguera, Oronzo, 4,163,652, Cl. 62-28.000.
Illuminati, Gabriello; and Romano, Ugo, 4,163,861, Cl. 560-132.000.
Snyder, Robert C., to Motor Wheel Corporation. Control system for double-actuator brakes. 4,163,586, Cl. 303-20.000.
Societe Alsacienne de Constructions Mecaniques de Mulhouse: *See—*
Laflaquiere, Regis; Janousek, Rade; and Faessler, Rene, 4,163,304, Cl. 19-97.000.
Societe Anonyme des Ateliers Marcadet Mobilier: *See—*
Mourgue, Pascal N., 4,163,537, Cl. 248-188.100.
Societe Anonyme dite: LEMAIRE: *See—*
Renaut, Henry, 4,163,331, Cl. 38-12.000.
Societe Anonyme Francaise du Ferodo: *See—*
Neveux, Rene E., 4,163,415, Cl. 98-2.090.
Societe Lignes Telegraphiques et Telephoniques: *See—*
Ernyei, Herbert; and Langlois, Etienne, 4,163,960, Cl. 333-198.000.
Hulin, Jean-Pierre; and de Vecchis, Michel, 4,163,641, Cl. 425-461.000.
Societe Nationale des Poudres et Explosifs: *See—*
Malassine, Bernard P.; Gautier, Jean-Claude C.; Chevalier, Sammy H.; and Berteleau, Gerard R., 4,163,740, Cl. 260-31.20N.
Societe Nationale Industrielle Aerospatiale: *See—*
Legrand, Francis, 4,164,018, Cl. 364-424.000.
Soldner, Richard E., to Siemens Aktiengesellschaft. Method of ultrasonic scanning of bodies. 4,163,394, Cl. 73-626.000.
Solender, Peter E., to Wurlitzer Company, The. Programmable rhythm unit. 4,163,407, Cl. 84-1.030.
Solo Industries Pty. Limited: *See—*
Notaras, John A.; Notaras, Angelo L.; and Williams, James P., 4,163,437, Cl. 123-148.00E.
Solomon, Arieh. Board game. 4,163,560, Cl. 273-273.000.
Sommer, Rudiger: *See—*
Angelbeck, Rolf; Gesell, Reinhard; and Sommer, Rudiger, 4,163,980, Cl. 346-155.000.
Sony Corporation: *See—*
Abe, Akira, 4,163,533, Cl. 242-198.000.
Akazawa, Susumu; Murakami, Kyoichi; Ishihata, Kiyoshi; and Tsuchiya, Takao, 4,163,989, Cl. 358-27.000.
Sakamoto, Hitoshi; and Wakisaka, Yoshiaki, 4,163,994, Cl. 360-70.000.
Sorensen, Soren K.; and Holbek, Carl C., to Radiometer A/S. Reference liquid for blood gas equipment. 4,163,734, Cl. 252-408.000.
Sotirianos, Konstantin: *See—*
Muller, Hans; and Sotirianos, Konstantin, 4,163,724, Cl. 210-323.00T.
Souzu, Isao: *See—*
Kubo, Kazuo; Ito, Noriki; Souzu, Isao; Isomura, Yasuo; and Homma, Hiroshige, 4,163,844, Cl. 544-32.000.
Spector, George: *See—*
Riedinger, Larry, Jr.; and Spector, George, 4,163,575, Cl. 294-5.000.
Speechley, Richard E.: *See—*
Connolly, John R.; Gibson, David E.; Heimark, Edward L.; Quinn, Jerome B.; Speechley, Richard E.; and Winter, Richard L., 4,163,631, Cl. 416-185.000.
Speigel, Kenneth, to GTE Sylvania Incorporated. Cathode ray tube internal resistive coating and method of manufacture. 4,163,919, Cl. 313-479.000.
Speiser, Jeffrey M.: *See—*
Whitehouse, Harper J.; and Speiser, Jeffrey M., 4,164,023, Cl. 364-862.000.
Sperry Rand Corporation: *See—*
Rattlingourd, Glen D.; and Zscheile, John W., Jr., 4,164,022, Cl. 364-729.000.
Sperry Rand Limited: *See—*
Hughes, David, 4,163,325, Cl. 33-346.000.
Spickett, Robert G. W.: *See—*
Mauri, Jacinto M.; Vega-Noverola, Armando; and Spickett, Robert G. W., 4,163,789, Cl. 424-267.000
Spragg, Roger D.: *See—*
Shepherd, Eric G.; and Spragg, Roger D., 4,163,978, Cl. 343-120.000.
Sprague Electric Company: *See—*
Cheseldine, David M., 4,164,005, Cl. 361-433.000.
Garlington, Frank E.; and Famiano, Carl J., 4,163,956, Cl. 333-12.000.
Kolkowski, James J., 4,164,006, Cl. 361-433.000.
Sprenger, Barbara A., personal representative: *See—*
Sprenger, William K., deceased, 4,163,859, Cl. 560-53.000.
Sprenger, William K., deceased (by Sprenger, Barbara A., personal representative), to G. D. Searle & Co. Phenoxyldialkyl acetic acids and esters. 4,163,859, Cl. 560-53.000.
Springthorpe, Anthony J.; and Dyment, John C., to Northern Telecom Limited. Double heterostructure laser for direct coupling to an optical fiber. 4,163,953, Cl. 331-94.50H.
SPS Technologies, Inc.: *See—*
Sigmund, Jerry A., 4,163,310, Cl. 29-407.000.
Sigmund, Jerry A., 4,163,311, Cl. 29-407.000.
Square D Company: *See—*
Lass, John L., 4,163,501, Cl. 220-3.600.
Stabile, James, to Union Carbide Corporation. Compensating rotor. 4,163,519, Cl. 233-26.000.
Stahlhofen, Paul, to Hoechst Aktiengesellschaft. Photosensitive composition. 4,163,672, Cl. 96-91.00D.
Stamicarbon, B.V.: *See—*
Biermans, Andreas J., 4,163,648, Cl. 55-70.000.
Stanadyne, Inc.: *See—*
Roosa, Vernon D., 4,163,521, Cl. 239-86.000.
Standard Oil Company, The: *See—*
Duke, June T.; and Prem, Dorothy C., 4,163,766, Cl. 525-230.000.
Standard Oil Company (Ohio): *See—*
Dolhyj, Serge R.; and Milberger, Ernest C., 4,163,862, Cl. 562-534.000.
Stanger, Colin N. Roofing panels. 4,163,445, Cl. 126-428.000.
Stansfield, James F.: *See—*
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Staples, John M.: *See—*
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Stauffer Chemical Company: *See—*
Giolito, Silvio L., 4,163,767, Cl. 260-929.000.
Walker, Francis H., 4,163,660, Cl. 71-88.000.
Steelcase Inc.: *See—*
Breidenbach, James H., 4,163,867, Cl. 174-48.000.
Steffan, Guido: *See—*
Barth, Otto; Becker, Hans-Joachim; Behre, Horst; Kaiser, Reinhard; Steffan, Guido; and Zander, Jurgen, 4,163,752, Cl. 260-508.000.
Stenstrom, Sadie M. Compartmented card game box with removable drawer. 4,163,559, Cl. 273-148.00A.
Stephan, Hans-Werner: *See—*
Elsner, Georg; Heymer, Gero; and Stephan, Hans-Werner, 4,163,760, Cl. 260-606.50P.
Stephens, Milton L., to Textron Inc. Method of manufacturing molded top stop. 4,163,768, Cl. 264-23.000.
Stephenson, Robert L.; Fox, William R.; and Gavagan, James A., to Allied Chemical Corporation. Web-sensitive switch assembly. 4,163,880, Cl. 200-61.58B.
Stern, Robert G.; and Wallace, W. Thomas. Snowball maker. 4,163,639, Cl. 425-318.000.
Steuer, Werner: *See—*
Bauer, Kurt; and Steuer, Werner, 4,163,759, Cl. 260-600.00A.
Stitt Spark Plug Company: *See—*
Brenholts, Alfred R., 4,163,597, Cl. 339-100.000.
Stollberg, Ray H., to Crown Zellerbach Corporation. Shipping container. 4,163,494, Cl. 206-423.000.
Stonefield Developments (Paisley) Limited: *See—*
Watson, Norman F., 4,163,578, Cl. 296-204.000.
Stonehart, Paul: *See—*
Kohlmayr, Gerda M.; and Stonehart, Paul, 4,163,811, Cl. 427-115.000.
Stotts, Hugh D. Wire connector. 4,163,868, Cl. 174-87.000.
Strenger, Marshall C. Method of and apparatus for dispensing a multiconstituent beverage. 4,163,510, Cl. 222-129.200.
Strickler, Hugo, to Firmenich SA. Process for the preparation of a bicyclic alcohol. 4,163,866, Cl. 568-819.000.
Strong, Donald. Apparatus for cutting dovetail joints. 4,163,465, Cl. 144-87.000.
Strunc, Gerald R.: *See—*
Diesch, Robert E.; and Strunc, Gerald R., 4,163,405, Cl. 83-371.000.
Stuckler, Gerd. Arrangement for mounting components on a carrier board and method of indicating mounting locations. 4,163,309, Cl. 29-407.000.
Stultz, Hubert F., to Suburban Manufacturing Company. Radiant heater. 4,163,440, Cl. 126-60.000.
Sub Sea Research & Development Corp.: *See—*
Johnson, John L.; and Vanzant, Billy W., 4,163,477, Cl. 166-362.000.
Suburban Manufacturing Company: *See—*
Stultz, Hubert F., 4,163,440, Cl. 126-60.000.
Sugihara, Masanori, to Beltek Corporation. Cassette accepting and ejecting device. 4,163,997, Cl. 360-137.000.
Sugimoto, Yukio: *See—*
Miki, Sukeichi; Ninomiya, Shuichi; Fukuda, Shin; and Sugimoto, Yukio, 4,163,943, Cl. 325-433.000.
Sugiura, Katsuaki: *See—*
Takeuchi, Tatuo; Ono, Kazuyoshi; Furukawa, Naotake; Sugiura, Katsuaki; Suzuki, Osamu; and Shimizu, Takeshi, 4,163,358, Cl. 57-78.000.
Sugiura, Susumu: *See—*
Komatsu, Toshiyuki; Takasu, Yoshio; Fujii, Motoharu; and Sugiura, Susumu, 4,163,892, Cl. 219-216.000.
Sumi, Kazumasa: *See—*
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Sumitomo Chemical Company, Limited: *See—*
Sano, Takezo; Shimomura, Takatoshi; Sasaki, Masao; Murase, Ichiki; and Hirakawa, Manabu, 4,163,725, Cl. 210-490.000.
Sumitomo Electric Industries, Ltd.: *See—*
Kawaguchi, Munetaka; and Miyake, Masayoshi, 4,163,826, Cl. 428-371.000.
Sumitomo Jukikai Envirotech, Inc.: *See—*
Ikari, Yoshikatsu; Yokoyama, Shiyoichiro; and Katoh, Keisuke, 4,163,715, Cl. 210-28.000.
Sun, Jui-Yuan: *See—*
Burk, Emmett H.; Yoo, Jin S.; Karch, John A.; and Sun, Jui-Yuan, 4,163,709, Cl. 208-120.000.
Burk, Emmett H.; Yoo, Jin S.; Karch, John A.; and Sun, Jui-Yuan, 4,163,710, Cl. 208-120.000.

Sun Oil Company, Ltd.: *See—*
Lichtenberger, Gunter J., 4,163,620, Cl. 405-217.000.
Sundstrand Corporation: *See—*
Barratt, Thomas R., 4,163,913, Cl. 310-91.000.
Glennon, Timothy F.; Sarphie, Theodore E.; and Faulkner, Dennis T., 4,164,033, Cl. 364-431.000.
Glennon, Timothy F.; Sarphie, Theodore E.; and Faulkner, Dennis T., 4,164,034, Cl. 364-431.000.
Glennon, Timothy F.; and Sarphie, Theodore E., 4,164,035, Cl. 364-431.000.
Superior Electric Company, The: *See—*
Leenhouts, Albert C., 4,163,932, Cl. 318-573.000.
Sutter Hospitals Medical Research Foundation: *See—*
Simes, James G.; and Gillott, Donald H., 4,163,911, Cl. 310-27.000.
Suzuki, Fujio: *See—*
Ishida, Nakao; Suzuki, Fujio; Maeda, Hiroshi; Fujii, Toshikatsu; and Mizutani, Ituro, 4,163,780, Cl. 424-116.000.
Suzuki, Osamu: *See—*
Takeuchi, Tatuo; Ono, Kazuyoshi; Furukawa, Naotake; Sugiura, Katsuaki; Suzuki, Osamu; and Shimizu, Takeshi, 4,163,358, Cl. 57-78.000.
Suzuki, Suzuo, to Nissan Motor Company, Limited. Method and apparatus for electrical measurement of fluid flow rate. 4,163,389, Cl. 73-194.00F.
Svenskt Stal Aktiebolag: *See—*
Pusa, Onni, 4,163,663, Cl. 75-60.000.
Swayze, Lloyd D.: *See—*
Hall, Gerald D.; and Swayze, Lloyd D., 4,163,628, Cl. 414-699.000.
Swiatek, Henry J., to Norton Company. Method for producing coated abrasives. 4,163,647, Cl. 51-295.000.
Symborski, Alex P.; Fulmer, Ray M.; and Thomas, David W., to Owens-Corning Fiberglas Corporation. Method and apparatus for forming and collecting discrete fibers and/or strands. 4,163,653, Cl. 65-2.000.
Syrchikov, Sergei A.; and Tulsky, Vladimir L. Process for carbonitriding steel and cast iron articles. 4,163,680, Cl. 148-16.500.
Szamitastechnikai Koordinacios Intezet: *See—*
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Teng, Robert N., to United States of America, Air Force. Breech closure mechanism. 4,163,411, Cl. 89-1.00H.
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Lou, Perry W.; and Grant, Charles P., Jr., deceased, 4,164,031, Cl. 365-233.000.
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Guilhem, Robert; Rivron, Maurice; and Weulersse, Bruno, 4,163,975, Cl. 343-16.00M.
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Tiso, Marian. Apparatus for facilitating the practicing of tennis and like games. 4,163,552, Cl. 273-29.00A.

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Horn, Hans, 4,163,569, Cl. 280-605.000.

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Towmotor Corporation: *See*—
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Turini, Gerhard, to Siemens Aktiengesellschaft. Toner fixing arrangement in electrostatic printers and copiers. 4,163,893, Cl. 219-216.000.

Turnbull, Roy H., to Feltex Limited. Process for the purification of contaminated water. 4,163,716, Cl. 210-28.000.

Turner, James H., to Chevron Research Company. Bounce crimper outlet apparatus. 4,163,306, Cl. 28-254.000.

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Ugo, Renato, to PROTEC Processi e Tecnologie S.p.A. Process for precipitating precious metals from solutions which contain them. 4,163,664, Cl. 75-108.000.

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Bube, Kenneth R. Solar cell with improved N-region contact and method of forming the same. 4,163,678, Cl. 136-89.0CC.
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Schack, Carl J.; and Christe, Karl O., 4,163,774, Cl. 423-351.000.
Whitehouse, Harper J.; and Speiser, Jeffrey M., 4,164,023, Cl. 364-862.000.

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Monneraye, Marc A.; and Monnier, Michel J. C., 4,163,656, Cl. 65-43.000.
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United Technologies Corporation: *See*—
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Universal Manufacturing Corporation: *See*—
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Johnson, Roy A.; and Sih, John C., 4,163,842, Cl. 542-426.000.

Ury, John M., to Wagner Electric Corporation. Service and emergency trailer valve. 4,163,585, Cl. 303-9.000.

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Van der Mey, John E.; and Kremers, Frank J., to Allied Chemical Corporation. Thin film reaction process. 4,163,751, Cl. 260-457.000.

Vanderslice, Ira C. Camper module. 4,163,577, Cl. 296-164.000.

van der Sluijs, Willem L. N., to U.S. Philips Corporation. Device for extracting moisture from a space. 4,163,373, Cl. 62-279.000.

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Vasseur, Bernard, to LITA. Electrical supply device. 4,163,595, Cl. 339-88.00R.

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Vincent, Raymond A. Multicolor paint dispensing system having a pressure responsive color change valve. 4,163,523, Cl. 239-305.000.

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Vock, Richard C., to Xerox Corporation. Closed loop particle dispenser. 4,163,614, Cl. 355-3.0DD.

Voegeli, Otto, to International Business Machines Corporation. Current access bubble memory system. 4,164,028, Cl. 365-20.000.

Voss, Kurt H., to Bergwerksverband GmbH. Pneumatic stowing apparatus. 4,163,582, Cl. 406-12.000.

Vriend, Joseph A. Apparatus for producing power from water waves. 4,163,633, Cl. 417-332.000.

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Fujitaki, Roy K., 4,163,375, Cl. 70-134.000.

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Wahl, Eugene A. Feeder apparatus for fibrous materials. 4,163,489, Cl. 198-505.000.

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Walker, Loren H.: *See—*
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Walter, Brian W., to Smith & Nephew Research Limited. Pressure sensitive adhesive material and method of preparation. 4,163,822, Cl. 428-304.000.

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Warren, John B.; and Kundrath, Michael R., to Connecticut Research Institute, Inc. Composite electron microscope grid suitable for energy dispersive X-ray analysis, process for producing the same and other micro-components. 4,163,900, Cl. 250-439.00R.

Wasserman, Harry H.; and Tremper, Alan W., to Research Corporation. Beta-lactams, their production from azetidine carboxylic acids, intermediates thereto and derivatives thereof. 4,163,743, Cl. 260-239.00A.

Watson, Clifford A.; and Bonham, David W., to Tepco, Incorporated. Portable electronic precipitator. 4,163,650, Cl. 55-126.000.

Watson, Norman F., to Stonefield Developments (Paisley) Limited. Main frame assembly for road vehicles. 4,163,578, Cl. 296-204.000.

Watson, Robert E.: *See—*
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LIST OF DEFENSIVE PUBLICATIONS

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Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O. G. 687.

Allied Chemical Corporation: *See*—
Stephenson, Robert L., T985,002, Cl. 242-107.40R.

Bertozzi, Eugene R.; and Paul, Henry N., 3rd, to Thiokol Corporation. Synergistic light stabilizer blends for poly(vinyl chloride) polymers. T985,003, 8-7-79, Cl. 260-45.75S.

Caterpillar Tractor Co.: *See*—
Drochner, Erich E., T985,006, Cl. 403-163.000.

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Danby, Maurice: *See*—
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Drochner, Erich E., to Caterpillar Tractor Co. Retaining means for pivot pin. T985,006, 8-7-79, Cl. 403-163.000.

Goertzel, Gerald; and Mitchell, Joan L. Two-dimensional image data compression and decompression system. T985,005, 8-7-79, Cl. 364-515.000.

Imperial Chemical Industries Limited: *See*—
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Paul, Henry N., 3rd. Synergistic ultraviolet light stabilizer mixtures for mono-olefin polymers. T985,004, 8-7-79, Cl. 260-45.70S.

Paul, Henry N., 3rd: *See*—
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Reade, Grahame M.; Clarke, William; and Danby, Maurice, to Imperial Chemical Industries Limited. Coloration process. T985,001, 8-7-79, Cl. 8-2.50R.

Stephenson, Robert L., to Allied Chemical Corporation. Seat belt retractor base and cover. T985,002, 8-7-79, Cl. 242-107.40R.

Thiokol Corporation: *See*—
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LIST OF REISSUE PATENTEES

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Muller, Keith; Stewart, Michael; and Kochen, Stanley, 252,589, Cl. D25-80.000.
Kovach, Thomas L. Serological pipette. 252,586, 8-7-79, Cl. D24-55.000.
Kretz, Edward J., to Owens-Illinois, Inc. Bottle. 252,556, 8-7-79, Cl. D9-42.000.
Kutschmende, Ralph. Illuminated sign with channels for moveable character plates. 252,579, 8-7-79, Cl. D20-10.000.
Kutschmende, Ralph. Illuminated sign with channels for moveable character plates. 252,580, 8-7-79, Cl. D20-10.000.
Lage, Lyle W. Pig waterer. 252,592, 8-7-79, Cl. D30-15.000.
Lancer, Robert W. Tool handle. 252,554, 8-7-79, Cl. D8-83.000.
Lee, Robert K. Combined easel and supply cabinet for an artist. 252,549, 8-7-79, Cl. D6-179.000.
Leffler, Albert L., Jr.: *See—*
Harbage, Robert P.; and Leffler, Albert L., Jr., 252,567, Cl. D13-38.000.
Leopoldi, Norbert. Pen. 252,577, 8-7-79, Cl. D19-42.000.
Lewis, Charles M., to Procurement Management Services, Inc. Combined desk, locker and bunk bed unit. 252,542, 8-7-79, Cl. D6-4.000.
Lonnroth, Jonas, to Aktiebolaget Instrument Verken. Compass-rose scale. 252,560, 8-7-79, Cl. D10-74.000.
Maschinenfabrik Von Arx AG: *See—*
Dummermuth, Paul, 252,553, Cl. D8-62.000.
Max Factor & Co., legal representative: *See—*
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Genaro, Donald M.; McGarvey, John N.; and Sylvester, Gordon E., 252,569, Cl. D14-60.000.
Genaro, Donald M.; McGarvey, John N.; and Sylvester, Gordon E., 252,570, Cl. D14-60.000.
Motor Wheel Corporation: *See—*
Blanchard, Russell O., 252,565, Cl. D12-211.000.
Blanchard, Russell O., 252,566, Cl. D12-211.000.
Harty, Millard F., Jr., 252,564, Cl. D12-210.000.
Muller, Keith; Stewart, Michael; and Kochen, Stanley. Paving stone. 252,589, 8-7-79, Cl. D25-80.000.
Murphy, Cornelius J., to Riblet Products Corp. Automotive console ice chest and cooler. 252,540, 8-7-79, Cl. D3-40.000.
Not Sew, Ltd.: *See—*
Hollyday, Hughlett, 252,538, Cl. D3-26.000.
Ogawa, Iwakichi, to Takara Co., Ltd. Articulated toy figure. 252,581, 8-7-79, Cl. D21-177.000.
Owens-Illinois, Inc.: *See—*
Kretz, Edward J., 252,556, Cl. D9-42.000.
Palmer, Melvin B. Seat for a spa tank. 252,545, 8-7-79, Cl. D6-58.000.
Peretti, Elsa; and Max Factor & Co., legal representative. Cosmetic container. 252,590, 8-7-79, Cl. D28-80.000.
Peters-Revington Corporation: *See—*
Ungaro, Nicholas A., 252,547, Cl. D6-153.000.
Petersen, Warren D., to Burd, Inc., Howell Division. Chair or similar article. 252,544, 8-7-79, Cl. D6-31.000.
Petersen, Warren D., to Burd, Inc., Howell Division. Chair or similar article. 252,546, 8-7-79, Cl. D6-73.000.
Plant Site, Inc.: *See—*
Darwin, William B., 252,587, Cl. D25-15.000.
Plasti-Fab Co. Ltd.: *See—*
Hoffman, Paul R.; and Wallenwein, Hans K., 252,548, Cl. D6-157.000.
Procurement Management Services, Inc.: *See—*
Lewis, Charles M., 252,542, Cl. D6-4.000.
Rain, Lloyd H., to Irvin Industries Inc. Tent. 252,582, 8-7-79, Cl. D21-253.000.
Raz, Zeev. Toilet flush handle. 252,584, 8-7-79, Cl. D23-29.000.
Riblet Products Corp.: *See—*
Murphy, Cornelius J., 252,540, Cl. D3-40.000.
Robertson, Donald A.: *See—*
Walker, Marie E.; Forward, John E.; Robertson, Donald A.; and Hacknauer, Frank, 252,557, Cl. D9-216.000.
Rogers, Ronald G. Carrier for a pair of ice skates. 252,595, 8-7-79, Cl. D3-36.000.
Schreyer, Kenneth D., to Columbus McKinnon Corporation. Telescopic turnbuckle. 252,555, 8-7-79, Cl. D8-355.000.
Shelton, David R. Fishing plug. 252,583, 8-7-79, Cl. D22-27.000.
Simmons, Henry T., to Brown & Sharpe Manufacturing Company. Automatic lathe. 252,575, 8-7-79, Cl. D15-130.000.
Spinner, James F. Aquarium building. 252,588, 8-7-79, Cl. D25-19.000.
Stewart, Michael: *See—*
Muller, Keith; Stewart, Michael; and Kochen, Stanley, 252,589, Cl. D25-80.000.
Stimpel, Marion. Combined apron and detachable towel. 252,537, 8-7-79, Cl. D2-227.000.
Stoff, Norman B. Device for turning light switch on and off. 252,552, 8-7-79, Cl. D8-14.000.
Sylvester, Gordon E.: *See—*
Genaro, Donald M.; McGarvey, John N.; and Sylvester, Gordon E., 252,569, Cl. D14-60.000.
Genaro, Donald M.; McGarvey, John N.; and Sylvester, Gordon E., 252,570, Cl. D14-60.000.
Takara Co., Ltd.: *See—*
Ogawa, Iwakichi, 252,581, Cl. D21-177.000.
Taylor, Tad. Storage cabinet or similar article. 252,543, 8-7-79, Cl. D6-5.000.

Ungaro, Nicholas A., to Peters-Revington Corporation. Table. 252,547, 8-7-79, Cl. D6-153.000.
Van Koert, John P. American beaver sculpture or the like. 252,562, 8-7-79, Cl. D11-158.000.
Vivitar Corporation: *See*—
Cohee, Donald R., 252,539, Cl. D3-33.000.
Vredenburg, Edmund, to Vredenburg Leisure Time Products. Beverage serving cart. 252,563, 8-7-79, Cl. D12-22.000.
Vredenburg Leisure Time Products: *See*—
Vredenburg, Edmund, 252,563, Cl. D12-22.000.
Walker, Marie E.; Forward, John E.; Robertson, Donald A.; and Hacknauer, Frank, to Xerox Corporation. Toner container. 252,557, 8-7-79, Cl. D9-216.000.
Wallenwein, Hans K.: *See*—
Hoffman, Paul R.; and Wallenwein, Hans K., 252,548, Cl. D6-157.000.
Weger, Kurt H. Compactor. 252,573, 8-7-79, Cl. D15-123.000.
Xerox Corporation: *See*—
Walker, Marie E.; Forward, John E.; Robertson, Donald A.; and Hacknauer, Frank, 252,557, Cl. D9-216.000.

CLASSIFICATION OF PATENTS

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NOTE.—First number, class; second number, subclass; third number, patent number

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177	4,163,666

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371	4,163,405
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484	4,163,409

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451	4,163,412
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CLASS 134

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CLASS 136

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89 TF	4,163,677

CLASS 137

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240	4,163,458
344	4,163,459
625.4	4,163,460

CLASS 138

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90	4,163,462
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CLASS 144

87	4,163,465

CLASS 148

6.27	4,163,679
16.5	4,163,680

CLASS 149

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108.4	4,163,682

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347	4,163,467

CLASS 156

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CLASS 174

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CLASS 175

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CLASS 176

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1.5 R	4,163,872
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170 NC	4,163,878

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61.58 B	4,163,880
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314	4,163,883

CLASS 201

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538	4,163,496

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89	4,163,708
120	4,163,709
	4,163,710
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23 F	4,163,714
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232	4,163,721
236	4,163,722
319	4,163,723
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121 EB	4,163,889
	4,163,890
121 P	4,163,891
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290	4,163,895
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CLASS 242

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D2—	227	252,537		73	252,546	D9—	42	252,556			252,566		148	252,576	D24—	55	252,586
D3—	26	252,538		153	252,547		216	252,557	D13—	38	252,567	D19—	42	252,577	D25—	15	252,587
	33	252,539		157	252,548		224	252,558		40	252,568		86	252,578		19	252,588
	36	252,595		179	252,549		245	252,559	D14—	60	252,569	D20—	10	252,579		80	252,589
	40	252,540		190	252,550	D10—	74	252,560			252,570			252,580	D28—		252,590
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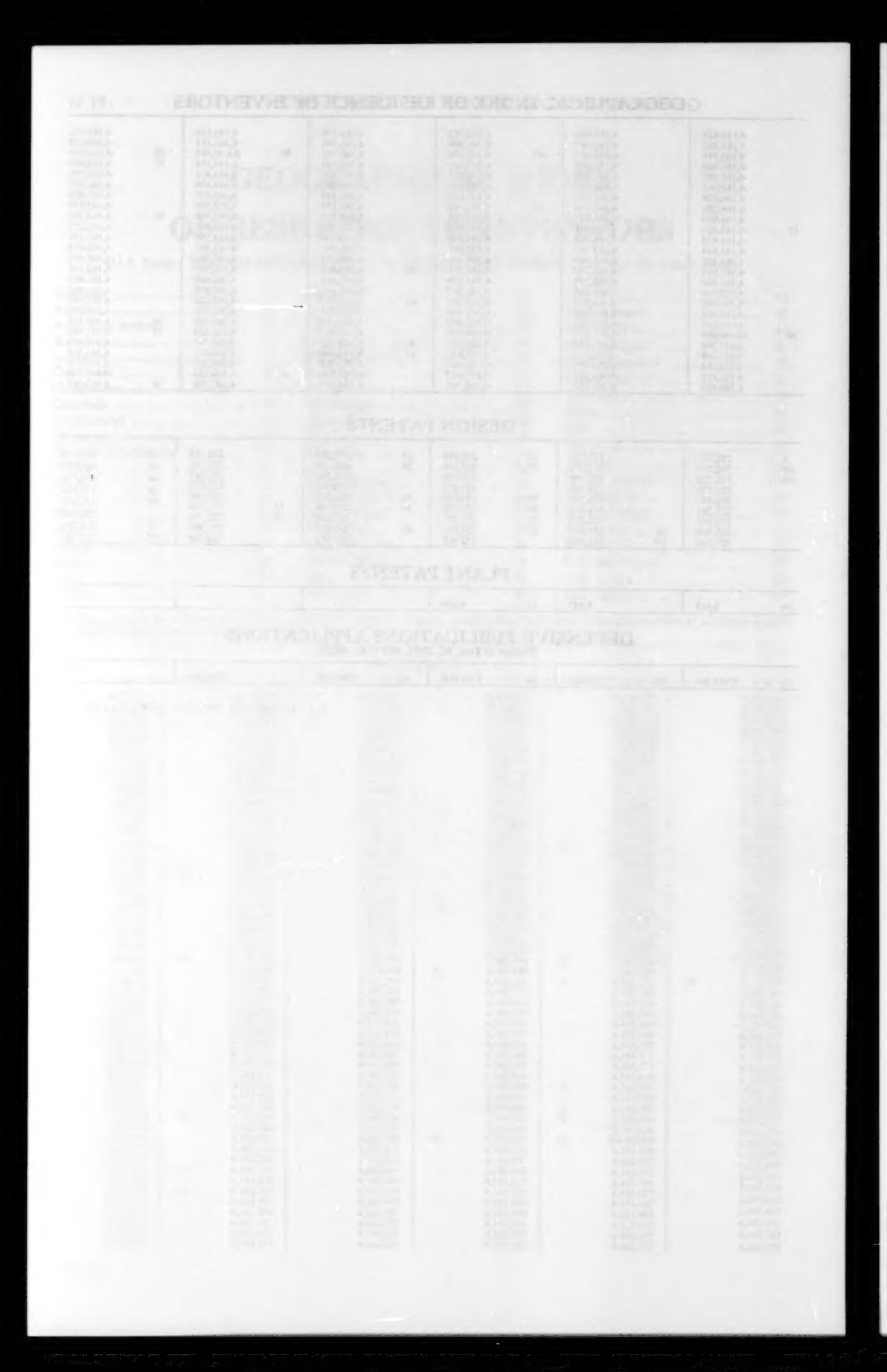

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